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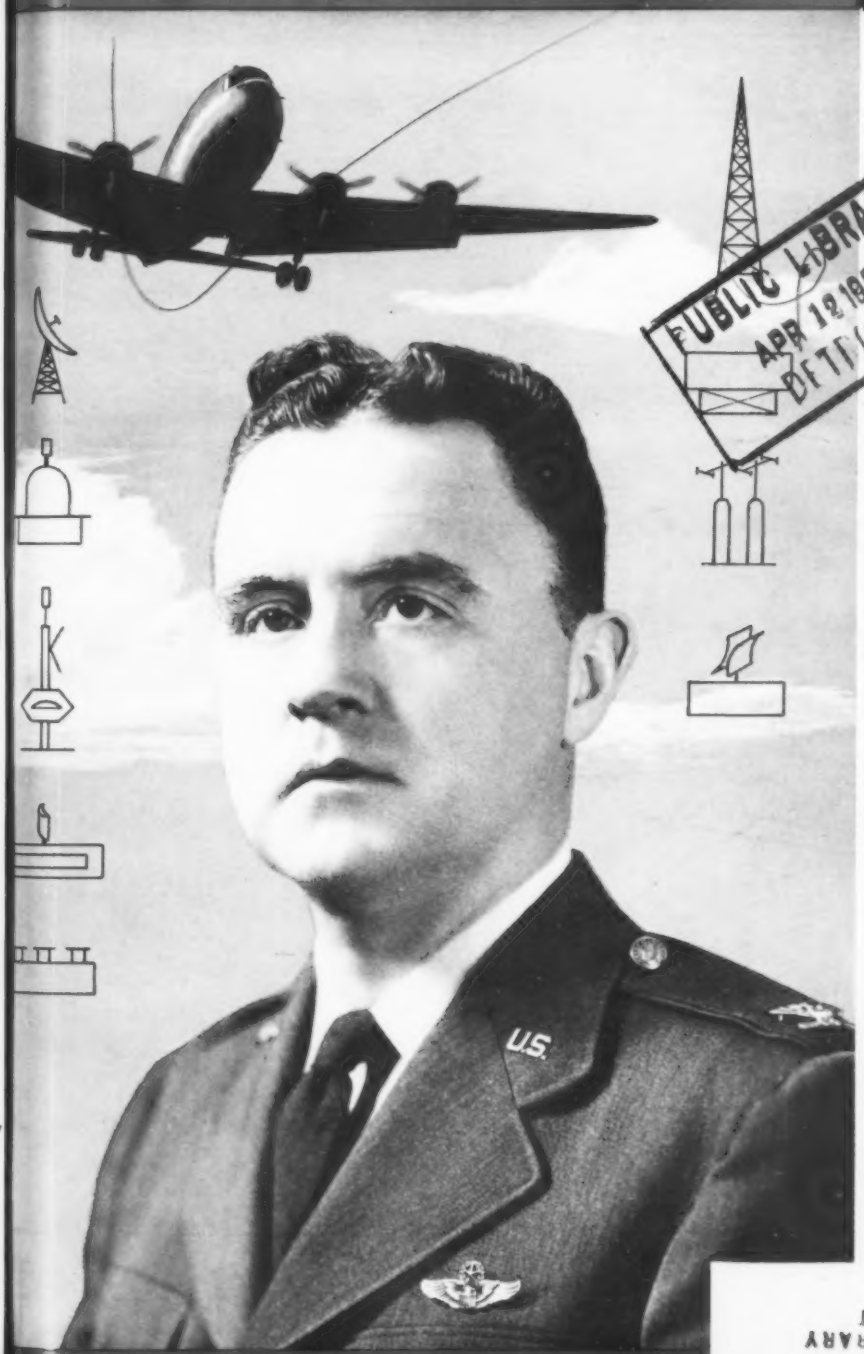

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The fighter pictured is the high-performance, photo-reconnaissance version of the Republic Thunderstreak, selected to prove this significant development with Convair's B-

Although Congress okayed the Air Force Academy, putting AF for the first time on a prestige par with Army's West Point and Navy's Annapolis, money for construction must still be appropriated ($26 million initially, $150 million total). And some Congressmen in key appropriations spots have opposed building at this time for economy reasons.

Meanwhile, location of Academy will be considered by five-man commission appointed by Air Secretary Talbott. Decision will be final only if unanimous; otherwise it's up to Talbott.

President Eisenhower has said he has a definite idea where Academy should be placed. Feeling around Pentagon is that it's Colorado Springs, Colo.

•

Airline fare increase may soon be needed. First quarter financial results, considerably below forecasts, in most cases, are causing concern.

Traffic growth has declined, expenses are still climbing. Big factor is depreciation of new planes going into service. Load factors are dropping as available seat-miles pull ahead of traffic demand. Increasing percentage of coach service is reducing per-mile income.

Carriers have been able to live off increased business, despite rising costs. But slow-down in growth brings a day of reckoning.

Elimination of round-trip discount, smaller reduction on family plan are mentioned as ways of increasing income, but there's no decision yet. Proposal has been made that carriers, through Air Transport Association, meet periodically with CAB to discuss their interpretation of traffic-financial results. This would include consideration of fare levels. There's no decision on this plan, either.

•

Navy still hasn't announced winner of its trainer competition, officially narrowed down to Beech's T-34 Mentor and Temco's Plebe, although manufacturers have been notified.

Best bet is that top Defense Department policy, not operational evaluation, determined winner of hotly contested competition between essentially similar planes. Defense may want single standardized USAF/Navy trainer (T-34 is in USAF production) or conversely favor having another trainer in the field (Temco's was built specifically for Navy competition).

•

Flight engineer controversy has broken out again. CAB must make a basic decision: should a fully-qualified pilot, without a flight engineer's certificate, be recognized as an acceptable third crew member?

This issue resulted in National Mediation Board entry into Eastern Air Lines-ALPA dispute to prevent a work stoppage. Negotiations broke down on EAL pilots' demand to be qualified as engineers to protect their cockpit authority.

Air Transport Association wants pilots recognized but failed to forestall controversial engineer rules in new CAR Part 40, which became effective April 1. CAB, however, will submit ATA-suggested changes for industry comment, and chances are there'll be at least one public hearing before final decision is made.

The Washington View

Total Danger Now?

The adequacy of American airpower has already become the subject of another "great debate" in the Senate, although the Upper Chamber is not scheduled to vote on military appropriations for another 6 to 8 weeks.

What shapes up as a major battle over the Eisenhower Administration's "new look" defense concept and defense budget was forecast in a kick-off speech by Sen. Stuart Symington (D., Mo.). The former Air Force Secretary led the losing fight a year ago against the $5 billion cut in Air Force funds.

The opposing forces, as they are being drawn up, are sharply divided along partisan lines. The Democrats, led by Senator Symington, from whom more will be heard, are accusing the Administration of inadequately preparing against a rising Soviet threat.

"The recent ominous explosions in the Pacific are just additional proof that we are now in that era some of us have predicted with dread for a long time—the period of total danger," Symington declared.

Defense of the Administration has been taken up by the two responsible Republican members: Sen. Leverett Saltonstall, Armed Services Committee chairman, and Sen. Homer Ferguson, Armed Services Appropriations Subcommittee chairman and head of the Senate Republican Policy Committee.

"Every confidence," Saltonstall said, can be put in the Administration's defense strategy. He not only denied charges leveled by Symington that the new Pentagon officials are "dragging" their feet on the build-up of airpower, but said, rather that they are building air power and other forces in an orderly manner best calculated for the long pull we must face.

The following were among other charges made by Symington, which the Republicans are trying to answer:

• **Aircraft production** is only running on one shift a day generally, whereas it ought to be running on three shifts. More planes could be produced if the Pentagon "really thought it important."

• **A "numbers game" is going on** in which the Administration is attempting to suggest that unobligated carry-over funds be counted a second and third time as new money or in the total sum.

• **"Phony sloganeering"** is being used to indicate a degree of readiness that is not in prospect.

• **The Soviet Air Force** is now more than half jet-equipped, whereas the U.S. Air Force will not be 50% jet powered until 1957.

• **The Pentagon** has denied to Congress necessary information to determine some of the basic facts of present military policy. Parts of the "new look" are just not understood.

• **The public** has been given official statements about the state of our continental defenses from Soviet air attack that are unjustifiably soothing.

"Should not this Administration now tell the American people about our relative position of strength as against that of the Soviet Communists?" Symington demands.

Small Business and the USAF

Out of its approximately 2800 prime contractors, the Air Force says some 2000 are small, independently owned concerns, for which the average contract value is $450,000. However, in recent testimony before the Senate Small Business Committee, it was revealed that the Air Force awards to small business during the first six months of fiscal 1954 were only 7.1% of the number of total prime contracts let.

The Air Force also testified that small business received 78% of those contracts which were considered "suitable contracts" for small business. The latter figure is comparable to the 75% of suitable contracts that the Defense Department said were received by small business over the same six months.

Over-all procurement figures for the period July through December, 1953, given by the Defense spokesmen showed that small business received a total of 27% of the $4½ billion awarded in prime contracts.

NACA Under Scrutiny

When the Independent Offices Appropriations bill was completed in the House, the National Advisory Committee for Aeronautics was tripped up twice by Appropriations Committee recommendations which were upheld.

The committee knocked out funds proposed by the President for a 400-man increase in the NACA staff and also suggested an inquiry into a possible duplication of activities with those of the Defense Department.

The Committee's report expressed the concern felt over NACA's operations as follows: "This agency has made many additions to its plant during the last few years under the unitary wind tunnel plan, as has the Department of Defense, and the committee expects to look over the part of the program managed by NACA at the earliest opportunity to be sure that there is no duplication of effort and that every economy is made in the maintenance and operation of the facilities."

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OTHER PUBLICATIONS . . .

American Aviation Daily, a daily news service for the entire industry. $200 per year. Managing Editor: Keith Saunders.

American Aviation Directory; twice yearly listing of products, people and organizations. $7.50 each. Managing Editor: Marion E. Grambow.

Official Airline Guide: Monthly publication of airline schedules and fares. $13.50 per year in USA; $14.00 in Canada; $15 elsewhere. Published from 139 N. Clark St., Chicago 2, Ill. Central 6-5804. Managing Editor: Robert Parrish.

Air Traffic News (incorporating Air Tariff Reports): Daily rates and tariff news. $175 per year. Managing Editor: Wallace I. Longstreth.

When & Where

Apr. 14—Nat'l Advisory Committee for Aeronautics, symposium on helicopter research for American Helicopter Society, Langley Field, Va.

Apr. 19-20—Symposium on automatic production of electronic equipment, sponsored jointly by Stanford Research Institute and USAF, Fairmont Hotel, San Francisco, Calif.

Apr. 21-23—Air Line Pilots Assn., 2d Annual Air Safety Forum, Chicago.

Apr. 21-24—2d Annual Student Paper Competition sponsored by Institute of the Aeronautical Sciences, Texas Section, Adolphus Hotel, Dallas.

Apr. 22-23—American Inst. of Electrical Engineers, conference on feedback controls, Claridge Hotel, Atlantic City, N. J.

Apr. 22-23—Radio Technical Commission for Aeronautics, joint aeronautical group meeting, Franklin Institute, Philadelphia.

Apr. 24-25—Air Force Assn., California Wing, 7th Annual Convention, Hotel Miramar, Santa Monica, Calif.

April 27-28—Air Traffic Conference, semi-annual meeting, Algiers Hotel, Miami Beach, Fla.

Apr. 27-29—Aviation Lighting Committee, Illuminating Engineering Society, technical conference, Milwaukee, Wis. Details from R. J. Stefany, Westinghouse Lamp Div., Bloomfield, N. J.

Apr. 27-30—Air Transport Assn., Purchasing Committee, Clift Hotel, San Francisco.

Apr. 29-30—American Society of Tool Engineers, 10th biennial industrial exposition, Convention Center, Philadelphia.

May 5-7—3d Int'l Aviation Trade Show, sponsored by Aircraft Trade Shows, Inc., 71st Regimental Armory, New York.

May 6-8—Fourth IAS West Coast Student Conference, Los Angeles.

May 6-8—First Annual IAS West Coast Industry-Faculty Conference, Los Angeles.

May 10-12—Institute of Radio Engineers National Conference on Airborne Electronics, Dayton Biltmore Hotel, Dayton, O.

May 16-19—American Association of Airport Executives, national convention, Kentucky Hotel, Louisville, Ky.

May 17-18—National Fire Protection Assn. Aviation Seminar, Statler Hotel, Washington, D. C.

June 1-5—National Convention of Flying Farmers, Yosemite National Park, Calif.

INTERNATIONAL

Apr. 21—ICAO Conference on coordination of air transport in Europe, Strasbourg, France.

Apr. 26-May 8—IATA Technical Conference on Training, Barcelona, Spain.

May 11—ICAO Special Communications mtg. Middle East region, Rhodes.

May 12-14—Engineering Institute of Canada Annual Meeting, Quebec.

May 31-June 11—Canadian International Trade Fair and National Air Show, Toronto.

June 1—ICAO Assembly, 8th session, Montreal.

June 15—ICAO Meteorological Division, 4th session, Montreal.

Sept. 7-12—Society of British Aircraft Constructors, Aircraft Show & Flying Display, Farnborough, England.

Sept. 13-17—IATA, 10th Annual General Meeting, Paris.

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Letters

NAPIER BIDS

To The Editor:

I congratulate you on an excellent article (Napier Bids for Share of U. S. Market) in AMERICAN AVIATION, March 15 issue.

I should certainly like to get 500 reprints of the article.

J. C. K. SHIPP
Group Aviation Representative
The English Electric Group
Dupont Circle Building
Washington, D. C.

REACTION

To the Editor:

I have intentionally waited to write regarding the publication of my interview, so I could see what the reaction would be, believing you might be interested.

First, my reaction on reading the interview was that I must compliment you on a very good job of editing.

Shortly after the publication, we received one telegram, half a dozen letters, and innumerable telephone calls and comments during my trips around the country.

All were complimentary; some partially critical of certain viewpoints whose interests they represented—but, generally, quite sound.

Kindest regards, and thanks again for your fine handling of the interview.

LEIGH FISHER
Leigh Fisher & Associates
P. O. Box 1168
South Bend 24, Indiana

SYMPATHY

To the Editor:

Thank you for your words of sympathy in the March 15 edition of AMERICAN AVIATION.

We are all aware of the up-hill fight awaiting us in the near future when competition will be tougher. Conditions generally have shown a slight turn for the better. During the summer season we are now operating a direct DC-4 flight nonstop between Geneva and Madrid, so that at least our Spanish traffic picture begins to look brighter. On the other fronts your description is quite correct.

In spite of all these obstacles we are an optimistic outfit. We expect to surpass our 1953 U. S. revenue by a nice little margin, even though we are still only flying between New York—Frankfurt—Zurich or New York—Geneva—Zurich. Our present summer schedule calls for seven flights a week and the inauguration of a weekly freight service.

Generally, we have strengthened our connections out of Switzerland to practically every destination of our network and we expect to be busy, very busy indeed, during this year.

Again, many thanks for shedding a tear for Swissair.

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Editorial

Mr. S. Speaks Up

SENATOR STUART SYMINGTON, the Democrat from Missouri and former Secretary of the Air Force, is emerging both as a powerful spokesman for air power and as an able critic of the Eisenhower Administration.

In two recent Senate speeches, he has minced no words on three important items.

by W. W. P.

• **Pointing to the failure of the Air Coordinating Committee** to implement air power policies promulgated twice since World War II, Senator Symington has called for a new Presidential air policy commission composed of top civilian leaders, as well as a new joint Congressional air policy board. His suggestions are sound.

• **Pointing to the failure of the Senate Armed Services Committee** to study and evaluate broad military policy, the Senator deplores the absence of civilian checking on military plans and calls for action in and by Congress. Are we preparing to fight World War II all over again, he rightly asks, or are we taking account of the sweeping technological revolution in armaments, and preparing for the kind of war we will have to fight in the future? He doesn't mention the chairman of the Armed Services Committee (Senator Saltonstall of Massachusetts) by name, but the inference is clear.

• **Thirdly, and most important,** the Senator poses some challenging questions to the present Pentagon regime. In our judgment these questions will be difficult to answer, because the Senator himself has defended five successive military budgets before the Congress and he is no neophyte when it comes to such figures. Essentially he challenges the Pentagon to disprove his assertion that it is engaging in a dangerous "numbers game" by using carry-over figures twice and misleading the public on the amount of money actually being obligated for air power purposes.

He also asks, just what *is* the air policy of the new administration. Well he might ask, because many of us are beginning to wonder if the so-called "new look" is not chiefly mere words, lacking genuine implementation in deeds. It is one thing to have a well-planned stretch-out; it is another to endanger the security of the country by delay and by insufficient planning for the future.

Senator Symington is a man to watch. He has gained greatly in stature. His latest speeches are certainly not going to be the last. Our guess is that he will increasingly become a rallying point for air power.

Good Try

The suspension of international services by Philippine Air Lines was sad news. Col. Andres Soriano, Ed Bolton, and many others, had built up a well managed and well operated airline which was initially destined to reach around the globe. It was an ambitious program for a prestige route by a small country. Economics, or in other words the inability of the Philippine Government to support the company adequately, caused the retrenchment into a domestic and regional system. We are sorry to see PAL disappear from the world picture; its service and operating efficiency had set a fast pace.

Two Good Starts

Ever since Chan Gurney took over the chairmanship of the Civil Aeronautics Board things have been bustling. The pace has quickened, the actions are more forthright and positive. Whether or not one agrees with all the CAB does, we are impressed with the manner in which Chan Gurney has taken over the leadership.

Another good choice of leader, it seems to us, is Earl Johnson, former Under Secretary of the Army, who is the new president of the Air Transport Association. Mr. Johnson is learning his job thoroughly before making any overt moves, but the signs are good.

Strangely Silent

The Interstate Commerce Commission has granted the railroads a 10% increase in mail pay, retroactive to last October 1, amounting to about $32 million a year.

Considering the extraordinary tactics of Post Office Department officials in browbeating the CAB and airlines on mail pay, they were mighty quiet about the railroad pay increase. Not a peep was heard.

Yet the $32 million *increase* (which is justified so far as we know) is equivalent to *total mail pay* of domestic trunk carriers for 1953; it is $2.5 million *more* than the *total* subsidy to domestic trunks, local carriers, and helicopter lines combined for fiscal 1955; and it is three times more than *total* mail pay for all Alaska airline services both interior and between the States and the Territory.

The P. O. has a very strange set of values these days.

Snafu, Class I

Release of photos and some details of the Lockheed and Convair vertical take-off airplanes last month was unquestionably the major military public relations snafu since World War II. It should be a signal for some real overhauling of the inept, uncoordinated, and confused system of handling announcements of new military weapons.

A detailed report of how the Navy first gave an exclusive to a national publication, and hamstrung the aircraft companies to an extraordinary extent, is hardly necessary at this point. But credit should go to Marvin Miles, aviation editor for the *Los Angeles Times*, for spearheading a movement to crack open the cosy deal set up by the Navy. Censorship for alleged security reasons has reached absurd heights in recent months. We hope Deputy Defense Secretary Fred Seaton, an experienced hand in the news world, will be successful in his efforts to supplant chaos with common sense procedures.

. . . WAYNE W. PARRISH

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Industry Spotlight

• More than 1000 Flying Boxcars have now been delivered by Fairchild's Aircraft Division at Hagerstown. The first XC-82 was built in 1944 and the line was changed over to C-119's late in 1947.

• U. S. Air Force and Navy have started liquid oxygen converters in new aircraft. Two companies are making converters, the Eclipse-Pioneer Division of Bendix, which has current installations under way for both services, and Arthur D. Little of Cambridge, Mass. A single 25-liter liquid oxygen converter stores the equivalent of 102 standard oxygen bottles. Volumetric ratio of liquid to gaseous oxygen is 1:800. There's an 8:1 space saving and 3½:1 weight saving in such systems.

• Phase-in of Beech T-34's and North American T-28's, which has started at three out of nine USAF primary training schools, is not likely to be completed until the fall of 1955. Air Force officials cite budgetary problems as major reason for slow-down in replacement of the Piper PA-18's and North American T-26's.

• Newest development at Douglas Aircraft Company is the "DC-6X," a modernized version of the earlier DC-6 having many of the features of the DC-7 but aimed specifically at the short haul market. Plane would be a standard DC-6B minus five feet of fuselage length (thus making it more like the original DC-6 on which production has been discontinued) but having DC-6B style Pratt & Whitney R-2800 engines and DC-7 type air conditioning and pressurization systems. Plans are being discussed with airline operators.

• Northrop Aircraft has received a $155 million contract extending F-89D production through August, 1956, and upping company backlog to $557 million. Delivery of D series Scorpions has been under way for 12 months.

• First meeting of the National Business Aircraft Association's special committee for design and production of a business aircraft is scheduled for April 23. Functions of the committee are to be coordination of technical data, specifications, and liaison with manufacturers to get an ideal business aircraft into production.

• Cessna Aircraft, which reportedly is into production with three prototype T-37 jet trainers, has received a million-dollar contract from the U. S. Air Force for engineering and tooling of the new trainer.

• Convair has hired veteran designer/pilot Ben Howard and turned a Convair 340 airplane over to him to see if he can increase the cruising speed of the twin engine plane to answer complaints of United Air Lines and KLM Royal Dutch Airlines regarding the plane's speed. Howard is reported already well along on his program and is making headway. Example: He found major "clean-up" item in nacelles, which had been designed to give clearance for a larger propeller that never materialized.

• Reports from Britain claim de Havilland is working on a Gyron Junior, developing about 8000 pounds thrust, which would power the lightweight Avro 720 fighter. The basic Gyron engine, which is reported to have the highest thrust per pound of weight of any jet engine, is said to develop twice that much thrust in developmental models, with production models slated for up to 20,000 pounds.

• Recent Pentagon declassification of USAF's Navarho long distance navigation system didn't leave the military services without a potential tactical system in reserve. Other system is Radux, a Naval Research Laboratory development, which has been ruled out of civil picture "for all time," thus averting another DME Tacan type controversy.

• France's SNECMA has built about 10 Vulcain turbojets, the 11,000-pound-thrust successor to the SNECMA Atar engine and the most powerful engine so far manufactured in France.

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This toroid, produced in our plant as part of a magnetic amplifier, was developed by our Control Engineering group. It is typical of the custom design work they do.

Designed for a flight control system utilizing artificial "feel," our magnetic amplifier depends neither on fragile vacuum tubes nor delicate relays. It is simple, and when fixed in a thermosetting compound, impervious to shock. Also important, it is Airborne engineered for Airborne-actuated control systems.

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RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

How B. F. Goodrich saves flying businessmen time, worry, money

TO MAKE important business calls, executives of the Hoover Company fly all over the country in this DC-3. Like many other executive planes, it carries B. F. Goodrich equipment to prevent delays, add safety, cut costs. Here's what Pilot Mickey McDowell and Co-pilot Dave Adams have to say about this BFG equipment:

1 B. F. GOODRICH ANTI-FREEZE FLUID FEED SHOES. "We never worry about propeller ice. The feed shoes do a great job." BFG propeller feed shoes are also economical to install, operate and maintain.

2 B. F. GOODRICH DE-ICERS. "We can count on your BFG De-Icers to keep the wings free of ice. They enable us to make trips we otherwise couldn't make." Practically every executive plane of twin-engine size or larger has tailor-made B. F. Goodrich De-Icers. They are easy to service, work efficiently under low pressure air.

3 B. F. GOODRICH DIMPLED TIRES. "There's *no* appreciable wear on our B. F. Goodrich dimpled tires after 14 months of service. There's less tread cutting, too." The dimpled tread of the BFG dimpled tire distributes the tire load better and reduces exposure to tread cutting.

4 B. F. GOODRICH EXPANDER TUBE BRAKES. "We had BFG Expander Tube brakes on our previous plane. We were so satisfied with them that when we found our DC-3 had another make, we replaced them with BFG brakes. They *feel* like brakes and have required *no* maintenance." BFG brakes not only give more landings per lining but are lighter, make landings smoother and safer.

All this time-saving, worry-saving and cost-saving B. F. Goodrich equipment is typical of the many developments for aviation that have come from B. F. Goodrich rubber research and engineering. Other BFG aviation products include heated rubber, Pressure Sealing Zippers, Avtrim, inflatable seals, fuel cells, Rivnuts, hose and other accessories. *The B. F. Goodrich Company, Aeronautical Sales, Akron, Ohio.*

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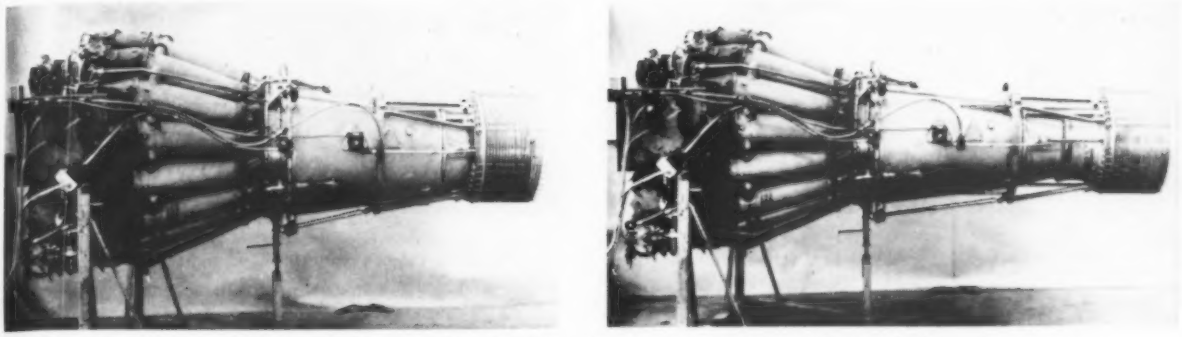


ON A DE HAVILLAND GOBLIN the reverse thrust unit developed by SNECMA is shown retracted for normal flight (left) and extended for reversing.

Four Firms in USAF Reverse Thrust Race

Big U. S. engine companies not yet in field; combat use bolsters application as landing aid.

By William D. Perreault

UNDER the impetus of competition for U. S. Air Force development funds, and ultimately for production orders, four distinct designs for jet engine thrust reversal devices made their appearance early this month.

High Pentagon officials predict that two, and possibly three, of these units will be flying in prototype form in USAF planes late this year. Basic Air Force interest revolves around the advantages which thrust reversal offers in shortening the landing run of jet fighters and bombers and thus increasing operational flexibility. No small factor, however, is the growing evidence of tactical in-flight applications of thrust reversal as a means of adding to the fighter pilot's "bag of tricks."

The whole field of jet thrust reversal, an infant industry which could grow to proportions larger than those of the reversible propeller market, is unique in that none of the big basic U. S. engine manufacturers appear to be pushing development. These are the companies with head starts:

• **Fairchild Engine and Airplane Co.** leads the field. It already has a USAF design contract to cover its unit.

• **Aerojet-General Corp.,** a division of the General Tire and Rubber Co., signed a licensing agreement with the French SNECMA (Societe Nationale d'Etude et de Construction de Moteurs d'Aviation) company for the U. S. production of the only reverse thrust device which has logged actual flight time. High Air Force officials acknowledge that they are about to contract with Aerojet for further development and flight test of the SNECMA thrust reverser.

Boeing's System

• **Boeing Airplane Company,** in a paper scheduled for delivery before the Society of Automotive Engineers in New York this week, announced details of its thrust reversal design.

• **Swiss Federal Institute of Technology,** in the person of Prof. J. Ackeret, disclosed detailed workings of Switzerland's much discussed reverse thrust device in a meeting before the Washington Section of The Institute of the Aeronautical Sciences and in personal talks with top USAF and U. S. Navy officers, as well as with individual manufacturers. A few details of this system had previously been released, but the new disclosures, plus Dr. Ackeret's timely appearance, are taken as significant.

Wright Field is reportedly now testing an original reverse thrust device of its own design which informed sources claim is very much like the SNECMA unit.

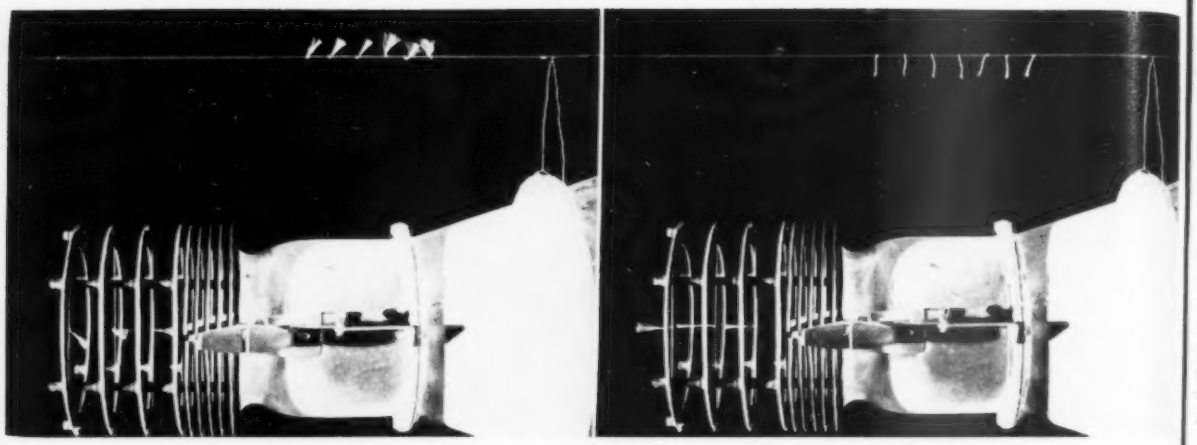
The USAF is still feeling its way in the field of reverse thrust. The existing Fairchild contract and projected Aerojet work is in the way of exploratory design to see what can be done. There are some basic questions:

• **How effective will thrust reversal be?** Best indications to date are that thrust reversal will stop a jet fighter in half the runway required to stop an ordinary jet. This assumes a system which reverses about 50% of the total engine thrust.

• **How much will the system cost in weight?** Aerojet officials claim it will run between three and six per cent of engine weight. In the case of SNECMA's experience it was about 85 pounds for the de Havilland Goblin engine and about 100 pounds for the higher-thrust Atar engine.

• **What will be its effect on normal engine thrust** with the reversal device inoperative? Engine and aircraft manufacturers are reluctant to accept any penalty to basic engine operation, since this would reduce range and payload. Theoretical studies show the penalty can be reduced to under two per cent of engine thrust. SNECMA experience with its first flying prototype resulted in about four per cent loss of normal thrust. The Atar installation had this penalty cut in half, and further improvements are to be expected.

• **Does thrust reversal affect afterburner operation?** This depends on the system and is largely a matter of claim and counterclaim today (see below). Some systems depend on a uniform



EFFECT OF REVERSE THRUST on bits of string is demonstrated above. When device is operating (left), string is blown by diverted jetstream. Under normal conditions (right) string hangs straight down.

cross section of exhaust gases as they leave the jet engine. Modern afterburner engines use variable nozzles which are closed during normal operation and open when the afterburner is operating, thus altering tail-pipe cross-section.

SNECMA has had considerable operating experience with its system. In addition to having actual installations on both a Goblin engine (in a de Havilland Vampire airplane) and on the high-thrust Atar engine, it has made more than 500 landings using the system. It is significant that 200 of these landings were made using one set of tires. This is double the normal tire life of the Vampire.

In the Vampire, in-flight thrust reversals have been made with the engine operating at full power. Deceleration has been in the order of 0.3 g.

Two of the systems, SNECMA's and the Swiss design, have the same basic means of reversing thrust. They vary in important details. The French system is illustrated in the accompanying photos, which show the circular rings mounted aft of the engine tail-pipe. In both systems jet reversal is brought about by deflecting engine exhaust gases into these deflector rings, which change the direction of gas flow.

Ackeret's unit uses mechanical vanes, mounted in the tail pipe, to impart a spiral motion to the gases and direct them into the deflector rings and forward. This involves the use of moving vanes in the hot tail pipe, or afterburner. Ackeret emphasizes that these are aerodynamically designed deflectors with little effect on normal thrust. He also notes that they could replace the flameholder of the afterburner or alternatively could be retractable.

SNECMA's thrust reverser uses air bled from the engine compressor and routed into the tail pipe through a hollow tube to deflect the engine gases into the rings. This eliminates the moving parts in the tail pipe and also reduces the amount of physical obstruction of the jet pipe. Furthermore, the Aerojet-licensed unit has the circular rings mounted on a pair of rails and actuated by an electric motor (see photos). When not in operation the thrust-reverser has the whole ring assembly retracted into a position forming a sheath around the tail pipe.

Fairchild uses a completely different approach. Reduced to its simplest form it consists of a pair of jaw-like air scoops normally held clear of the tail pipe opening. The pilot can operate these by pressing a switch which moves the scoops across the tail-pipe opening. In this position the eyelid-like scoops form three passages for the air, one small opening rearward and two side openings which direct air forward.

Boeing Airplane Company's system is somewhat like Fairchild's, using a 100% mechanical device in the form of a clamshell which retracts in two sections to become part of the jet tailpipe fairing when not in use. For reversal the clamshell halves are extended by struts to completely obstruct the jet stream, and by use of intergarl deflector plates to direct the exhaust forward.

Many other companies continue to be mentioned in connection with reverse thrust systems. These, logically enough, include Pratt & Whitney, General Electric, Rolls-Royce, and other engine manufacturers. Because development has been non-apparent, if not non-existent, during much of the life of the jet engine, Douglas Aircraft Co., Lockheed, de Havilland, and other transport manufacturers have all given the matter considerable engineering time.

The engineering demands of normal engine development have kept the big engine companies out of the picture. The current rash of developments is likely to fill the requirement and see the airframe companies drop the work.

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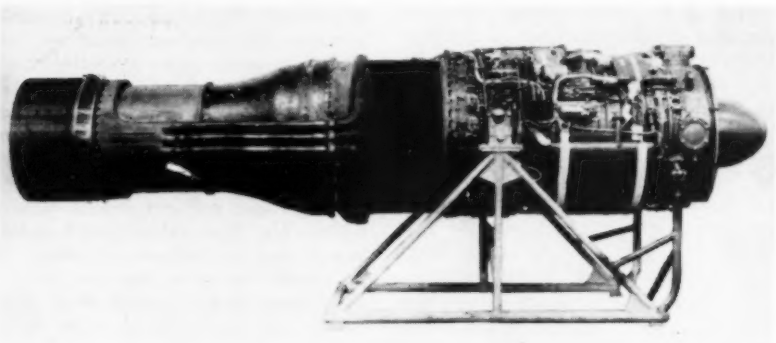


FRENCH MYSTERE II fighters which are powered by the Atar 101D will have SNECMA units as standard equipment. Aerojet-General Corp. is U. S. licensee.

Navy 'Copter Design Contest Brings Bids

A Navy design competition for a one-man helicopter for Marine Corps assault operations has attracted a number of companies.

Although the Navy's preliminary specifications for the small rotorcraft were reportedly studied by more than 20 firms, many with no previous experience in the helicopter field, the exact number who entered the competition has not been revealed. Deadline for submission of designs was reported to be April 5.

The helicopter would be even lighter than the small pulse-jet rotorcraft, the XH-26, now being developed by American Helicopter Co., Inc., Manhattan Beach, Calif., which is being purchased by Fairchild Engine & Airplane Corp., Hagerstown, Md. American has entered the Navy competition with a new rotorcraft design, it is understood.

Another company, Kaiser Metal Products, Inc., at Bristol, Pa., completed a design late last month for the competition, although it has not been definitely determined that Kaiser has entered the contest.

Other firms which have reportedly shown interest include Kellett Aircraft Corp., Camden, N. J.; Hiller Helicopters, Palo Alto, Calif.; Kaman Aircraft Corp., Windsor Locks, Conn.; McDonnell Aircraft Corp (Helicopter Div.), St. Louis, Mo.; and Bensen Aircraft Corp., Raleigh-Durham, N. C.

The Marines are seeking a small, collapsible helicopter that can be packaged and dropped by parachute into the field of action.

Simplicity is a keynote for its construction so that it can be assembled rapidly by troops. Its operation should be nearly as simple, it was pointed out, so that it can be piloted after a brief training period.

TIP-MOUNTED jet helicopter is tested for Navy by Hiller Helicopters. The rotocraft is designated the HJ-1.

Taking off in a hurry, a Boeing B-47 leaves behind it the smoke from 33 external JATO motors, as well as the exhaust from its own six jet engines. External installation provides 33,000 pounds extra thrust for take-off on short runways. Earlier motors, mounted internally, provided only 18,000 pounds. At right, a close-up of the JATO collar, which can be jettisoned.

Boeing Earns $20 Million in '53

Earnings of over $20 million after taxes may have brought the Boeing Airplane Co. to the position of second highest profit earner in the industry's history. Edging Boeing out is United Aircraft Corp., with a figure of $21.2 million.

Total Boeing sales during 1953 amounted to $918.3 million, almost $180 million above the figure for 1952. Earnings after taxes thus represented 2.21% of sales. During the previous year the figure was only 1.91%.

The year of 1953 also set Boeing records for delivery of aircraft in peacetime, as well as what were termed "substantial increases" in working capital and net worth by Boeing's president, William M. Allen.

When broken down by shares the company record stood as follows:

Net earnings per share: $12.51
Dividends per share: $3.50
Income taxes per share: $23.71

Since 1941, 70% of the company's net earnings have been plowed back into the firm, Allen reported. In 1953 Boeing spent just over $8 million on expanded facilities and new machinery. A second supersonic wind tunnel is being considered at present. Research and development costs were set at $14.6 million during the year.

The 707 jet transport had cost a total of $12.4 million as of the end of 1953. The figure is expected to reach $15.3 million by the time the plane flies this fall.

Backlog was reportedly $2.4 billion at the year's end, with sales volume in 1954 expected to exceed last year's.

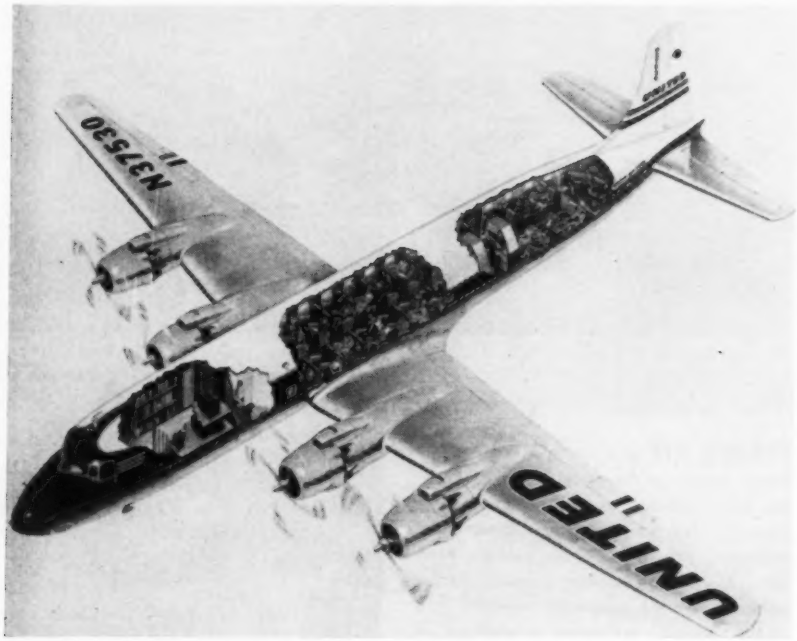
Navy Drops R4D-8 Modernization Plan

The Navy will not modernize an additional 100 Douglas R4D's into R4D-8 versions (Navy equivalent of the twin-engine Super DC-3), it has been learned.

Decision to eliminate the $37 million program, a reversal of plans early this year, was due in part to the heavy workload on other aircraft contracts at Douglas Aircraft Co.'s Santa Monica Division, where the modification was to take place.

As a result, some Navy work originally scheduled for Douglas' El Segundo Division is being transferred to Santa Monica.

Navy Bureau of Aeronautics plans for the program were revealed last summer in testimony before the House Appropriations Subcommittee. Douglas has already completed such modernization on approximately 100 Navy R4D's.



On June 1 the version of the Douglas DC-7 shown above is expected to go into service on United Air Lines routes. Sketch shows 58-passenger configuration, with baggage stowed behind cockpit. Interior is divided into two sections by wooden partitions; buffet flanks entrance door.

All Domestic Trunks on 'Open' Mail Rates

For the first time in almost three years, the domestic trunk-line industry is on an "open" mail rate basis. Reason is an industry-wide mail rate proceeding instituted by CAB late last month in a further effort to resolve service rate problems which have arisen since subsidy and service pay responsibilities were split between CAB and the Post Office last fall.

The entire trunk industry was placed on the open-rate status effective April 1. That means that when a new structure of mail rates is devised, it will be retroactive to the April 1 date.

Level Involved

The CAB action necessarily involves the "level" of airline mail rates, as contrasted with an investigation last December which dealt only with "structure." The carriers, who could get an increase or decrease in mail pay as a result of the new proceeding, have until April 23 to submit specific rate proposals to the CAB.

The Post Office, which did not accept a CAB invitation to respond to last December's investigation order, has again been invited to submit its views in the new proceeding.

The CAB action is considered a more concrete method of developing a rate structure which will satisfy problems raised by new Post Office policies, such as shipping mail via the lowest-rated carriers and using carriers with the shortest mileage between a pair of points.

Multi-Element Structure

In this respect CAB is not known to have changed its informal position which favors a multi-element structure for the industry. By making the carriers' rates subject to retroactive adjustment, the Board reportedly hopes to establish such a structure at an earlier date through greater industry cooperation.

The present structure has been in effect since September, 1951, when CAB established 45c per ton-mile as the final service rate for the Big Four, and based service rates of other carriers on its findings with respect to the Big Four's rates. Although certain individual carriers have been on an open or temporary rate basis since that time, the situation has had industry-wide application.

Tax Cut Will Save Industry $75 Million

Aircraft companies and one airline will have about $75 million more in net income in 1954 than they did in 1953 if their sales and earnings approximate those of the year just past, as a result of the expiration of the Federal excess profits tax, an AMERICAN AVIATION study indicates. The tax expired December 31.

Twelve of the 20 companies analyzed have fiscal years ending on December 31. As a result, they will have no EPT to pay for 1954.

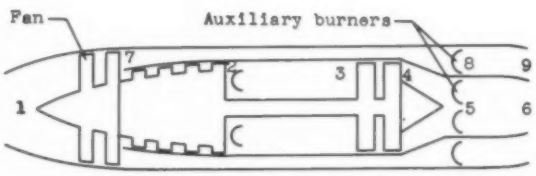
Two others have years ending on November 30, and they will have to pay EPT on the earnings recorded in December 1953.

The remainder range from fiscal years ending on June 30 (one), July 31 (one), September 30 (three), to October 31 (one). These firms will be obligated to pay EPT on gross income for the calendar 1953 months included in their 1954 fiscal years.

The following table indicates the excess profits taxes paid by 19 manufacturing companies and Eastern Air Lines for 1953.

Firm	Fiscal Year Ends	1953 EPT
Beech	9/30	$ .....
Bell	12/31	1,700,000
Boeing	12/31	9,800,000
Cessna	9/30	622,492
Convair	11/30	300,000
Curtiss-Wright	12/31	5,800,000
Douglas	11/30	11,170,000
Fairchild	12/31	2,646,120
General Dynamics	12/31	240,000
Grumman	12/31	4,339,628
Lockheed	12/31	8,450,000
Martin	12/31	.....
McDonnell	6/30	.....
North American	9/30	6,800,000
Northrop	7/31	1,112,500
Republic	12/31	4,965,000
Ryan	10/31	1,096,000
Temco	12/31	1,710,000
United Aircraft	12/31	12,444,301
Eastern Air Lines	12/31	1,250,000
TOTAL		$74,446,041

Turbo-Fan Engine



1 Compressor and fan inlet
2 Compressor outlet
3 Turbine inlet
4 Turbine outlet
5 Tail-pipe and auxiliary-burner inlet
6 Jet nozzle throat
7 Fan outlet
8 Auxiliary-burner inlet (secondary burner)
9 Jet-nozzle throat (secondary jet)

USAF Ready for By-Pass Engine Orders

Research by military and NACA moves ahead, but without production planned in immediate future.

By Robert M. Loebelson

DAYTON, O.—Though no high-thrust by-pass engine is in production in the U.S. and there is not even a development contract for such a powerplant in existence, officials of the Power Plant Laboratory of the USAF's Wright Air Development Center feel they know just what they want if the word comes down from the Pentagon that the Air Force requires one.

As one Wright Field engineer smilingly put it, "I don't think we could get the contract for a by-pass out in 24 hours; the paper work would take longer than that. But it wouldn't take us much more than two days once we got the go-ahead."

The by-pass engine, which is also frequently labeled the ducted-fan (and more recently the turbo-fan) engine, has many obvious advantages for both commercial and military use (American Aviation, January 4).

One U.S. engine producer is so convinced that there is a market for such a powerplant in this country that it is just about ready to bring a Rolls-Royce Conway, rated at 12,000 pounds of thrust, over from Britain for demonstration to the military services and U.S. airframe builders. The company is Westinghouse Electric Corp. of Kansas City, which has a technical assistance agreement with Rolls-Royce that could be expanded to include production of the Conway under license in the U.S.

Officials of the Air Research and Development Command's Power Plant Laboratory here are somewhat reluctant to discuss the entire subject for reasons of security, but they concede there is no American turbo-fan in the works and add that there has been none since budgetary cutbacks dictated the cancellation of the Packard J49 before the Korean war began.

They declare there is virtually no chance of revival of the J49 because too much time has elapsed, even though two or three of the Packard engines were completed and one was actually running on a test stand when the project was wiped out.

Nor are the Wright Field officials really enthused about the Conway.

"It isn't that we have anything against the Conway as such," they declared. "It's undoubtedly a fine engine. But based on our experience in making hand-built British engines producible in the past, we think we can let a contract now and have a by-pass engine in production in less time than would be required to redesign the Rolls-Royce model."

They were referring to the problems encountered by Pratt & Whitney and Curtiss-Wright in converting the Rolls-Royce Nene and Tay (J42 and J48), Armstrong-Siddeley Sapphire (J65), and Bristol Olympus (J67) to U.S. production standards.

There are six basic turbo-fan types with an infinite number of variations possible, engineers here report. But after a careful evaluation of all the possibilities, they have apparently pinpointed the specific type of engine they will want developed if the Air Force decides to go ahead with such a project.

But while no by-pass development is planned immediately by either the Navy or the Air Force, research is being conducted by both services and by the National Advisory Committee for Aeronautics as well, especially as the engine for a jet-powered vertical take-off fighter.

NACA, in a performance evaluation of ducted-fan engines relative to jet and turboprop engines, assuming equal air flow per unit frontal area, came up with the following findings:

• **Turbojets with afterburners** produced greater thrust per pound of air handled than any turbo-fan configuration.

• **At flight Mach numbers up to .85** the turboprop provided the lowest specific fuel consumption. By-pass engines designed for minimum net-thrust specific fuel consumption operated at 27% and 4% lower values (at flight Mach numbers of 0.3 and 0.9, respectively) than those obtainable from jets designed to obtain minimum SFC.

• **Below a flight Mach number of 0.6,** and for payload-to-gross-weight ratios of 0.3 or less, the turboprop realized the greatest range of any of the engines studied. Maximum range of both by-pass and jet engines occurred at Mach 0.6. At this speed and for zero payload, the by-pass showed a 5% increase in range over the turbojet, but at higher Mach numbers or where the payload-to-gross-weight ratio was 0.3 or higher, the range increase was negligible.

As a result, NACA scientists concluded:

• **Turbo-fan engines** show a higher thrust per unit frontal area only if compared with jets of lower air-handling capacity.

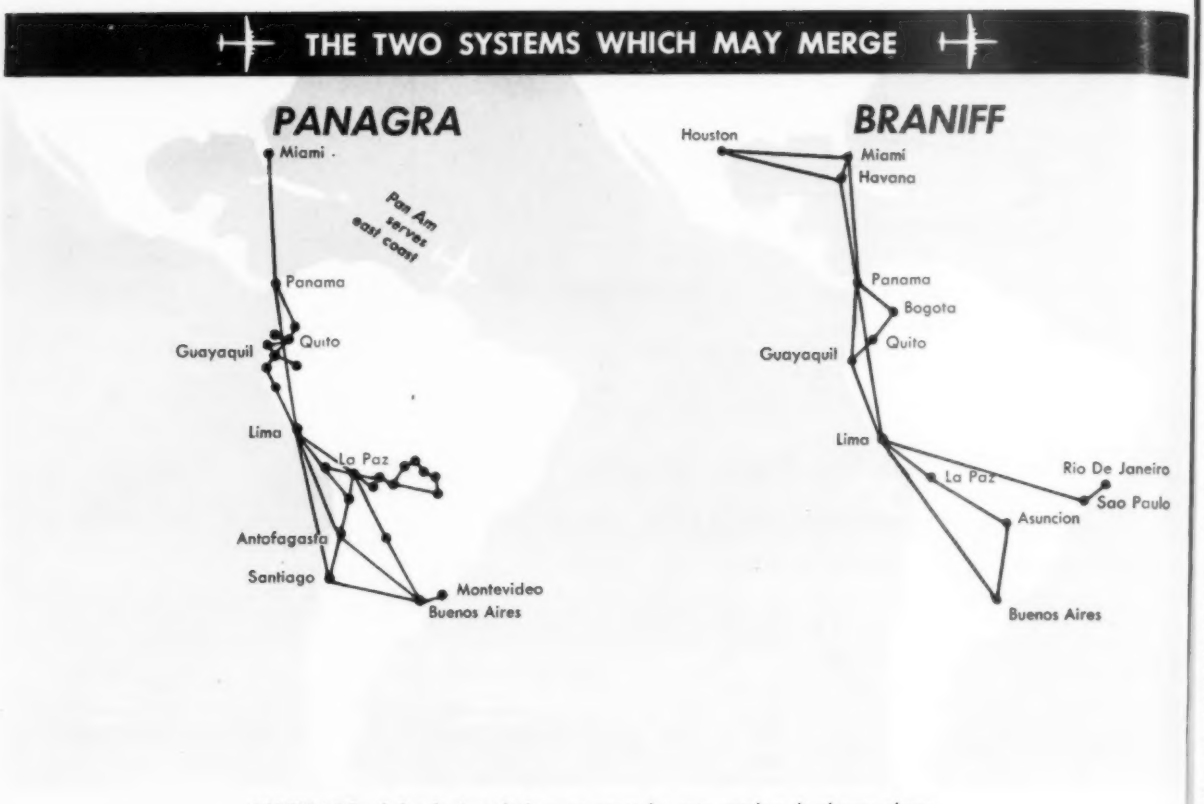
• **Where turbo-fan powerplants** are compared with turbojets of equal air-handling capacity per unit frontal area, no improvement in specific weight is indicated.

• **If flight speeds do not exceed Mach 0.6,** the turboprop should offer the most favorable performance of any of the engines considered. But when higher Mach numbers are desired, pure jets with afterburners would provide the greatest flexibility. • • •

Fairchild Outlook Called 'Encouraging'

Fairchild Engine & Airplane Corp. reports a 1953 net income of $4,013,541, or $1.74 a share, on sales of $170,135,266, compared with 1952's net of $3,148,621, or $1.36 a share, on sales of $141,642,703. Backlog on December 31 stood at $321 million, up from $310 million a year earlier.

Richard S. Boutelle, president, told stockholders in the annual report that last year's revisions of aircraft production schedules would have their full effect in 1954 and 1955 operations but added there were some compensating developments. "In general," he said, "the outlook is an encouraging one."



COVERAGE of South America's west coast by two carriers is shown above.

Shake-Up of Braniff, Panagra Routes Urged

Merger would leave BNF as surviving company; Pan American, Grace influence ruled out.

By William V. Henzey

THE Civil Aeronautics Board has called for creation of an independent U.S. airline to operate the west coast route of South America, combining the present international systems of Braniff Airways and Pan American-Grace Airways.

In the latest of many important developments in the controversial New York-Balboa Through Service Case, the Board deferred action on all applications in that case for a 60-day period, pending response to its Panagra-Braniff merger proposal.

Such a merged company, which must be free of control by Panagra's present co-owners—Pan American and W. R. Grace & Co—would have to be established on a voluntary basis. The CAB, however, has not disguised its intent to "look unfavorably" on a failure to accomplish the merger.

All five CAB Members voted for the move, which envisions an end to the annual $5 million subsidy paid for the more-or-less duplicating South American services of Panagra and Braniff. But the individual attitudes toward the proposed solution differed, with Member Oswald Ryan submitting a separate statement.

Braniff Statement

At press-time Braniff was the only party to issue a statement on the proposal, with president Charles E. Beard indicating that it is "a statesmanlike approach to a matter of major national and international importance."

Braniff's directors were scheduled to study the action in detail at an April 5 meeting in Dallas.

Neither Pan American nor Grace had at that time issued any formal statement, but reliable reports indicated those companies were not happy with the move. Their joint ownership of Panagra has been a stormy one, with the storm growing worse earlier this year when Attorney General Herbert Brownell, Jr., filed a civil anti-trust suit to break up their control of Panagra.

Four CAB Members—Chairman Gurney, Vice Chairman Denny, and Members Lee and Adams—felt recent events have had such an impact on the South American route situation as to render the proposed merger the most desirable solution. They listed such events as being:

- **The anti-trust action** to free Panagra of Pan Am and Grace control.
- **"Recent uncertainties"** as to the future of Braniff routes into Brazil.
- **The recent Supreme Court decision** requiring excess domestic profits to be offset against international subsidy needs.

Although unable to force a Braniff-Panagra merger directly, the four Members indicated they would not otherwise be disposed to approve a Pan American-

Panagra-Eastern interchange for through service between New York and Latin America, a major issue in the New York-Balboa Case.

They also served notice that renewal of the Through Flight Agreement, under which Panagra planes now gain access to Miami over Pan American's route, may be weighed in a new light. Previously, renewal of that agreement on a long-term basis was taken almost for granted.

Ryan Disagrees

Member Ryan, however, saw the merger as the inevitable result of the original certification of Braniff into South America in 1946. He dissented at that time in favor of continuing Panagra as the west coast operator and Pan Am as the east coast carrier without added U.S. competition.

Ryan also disagreed with the majority's reliance on the anti-trust suit as a basis for the proposed merger. "It is one of the most cherished traditions of our American jurisprudence that an accusation does not establish the fact." He did not see that suit as injecting any "prejudicial significance" into the through flight arrangement.

The 16-year veteran Member summed it up this way: "The problem confronting us is one of great complexity and is probably not susceptible of satisfactory solution without the voluntary and willing assistance of the carriers involved. While the course here taken is unique, we have a right to hope that the carriers may be able to work out by voluntary action a plan . . . for correcting the deficiencies in our existing South American route pattern and thereby make possible a substantial reduction in Federal subsidy."

Two Presidents

Two U.S. Presidents—first Truman and then Eisenhower—have declined to accept previous CAB solutions to decide the New York-Balboa Case by linking National with Pan Am and Panagra, and Eastern with Braniff for New York-South American interchange services.

• • •

C-46 Compliance Deferred to July 1

The CAB has deferred until July 1 the application of transport category requirements of the Civil Air Regulations to C-46 aircraft. A previous extension for the C-46 was to have expired at midnight, March 31. The CAB said the extension is to permit study of C-46 modifications submitted by the Aircraft Engineering Foundation and the Air Transport Association.

FAIREY GYRODYNE helicopter, with rotor drive from tip combustion chambers.

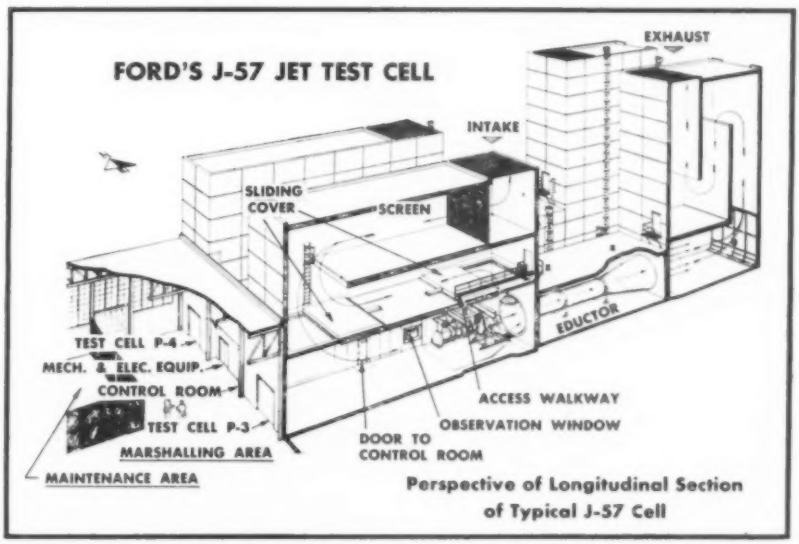
Gyrodyne 'Copter Completes Flight Tests

The Fairey Gyrodyne research helicopter has completed its initial flight tests. It is actually a rebuilt version of the remaining one of the two original prototypes and its sole purpose is to test the drive for the Rotodyne, Britain's first large (40-passenger) convertiplane, which Fairey Aviation Ltd. is building under government contract.

The Gyrodyne's rotor head is full scale for the Rotodyne, as are the blades (apart from being clipped to fit the lighter model). The Alvis Leonides engine in the fuselage drives two modified Rolls-Royce Griffon compressors, and two pusher propellers at the stub wingtips.

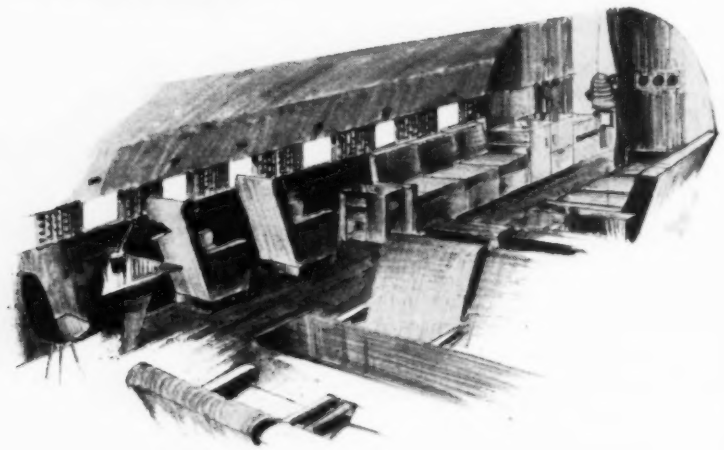
Air intake for the engine is behind a grill in the rotor pylon, whereas those for the compressors are at the top of the fuselage just behind the cabin.

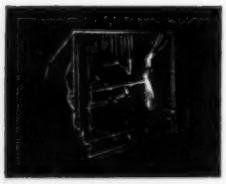
Rotor drive is from wingtip combustion chambers (pressure jets) supplied from the engine-driven compressors. The principle is to take off vertically with most of the engine power diverted to supplying compressed air. Once airborne, and at a safe height for the change-over, the pressure jets are shut off and full engine power goes to the propellers for forward propulsion. Lift is sustained by autorotation of the rotor and by the small stub wing (divided about fifty-fifty).



Ford's $4 million jet engine test facility, shown above, has just been completed, providing six cells for testing Pratt & Whitney J-57 engines which the Aircraft Engine Division of Ford Motor Company will start producing this year. The AED has just finished its first complete test of a J-57 engine. Cells are adjacent to the 6,660,000 square feet of engine production space in main plant.

CUSTOM CONVERSION FOR EXECUTIVE AIRCRAFT





Conversion of DC-3's, C-47's and C-53's into luxurious executive aircraft has long been a TEMCO specialty. Skilled craftsmen have transformed many cargo and military aircraft into magnificent executive transports that have met the exacting requirements of business executives both in this country and abroad. TEMCO's complete facilities assure you of the finest quality with economies that come only with experience. TEMCO will convert your present aircraft or now has planes of the above three types available for immediate conversion to your specifications. Write today for complete details.

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News Briefs

MANUFACTURING

A follow-on sub-contract for Lockheed T-33A wings has been given to Beech Aircraft, extending production into the spring of 1955 . . . **Funds for the atomic aircraft reactor program** continue to decrease: the AEC is looking for $14.2 million in fiscal 1955, compared with $15 million this year and $17.3 million in fiscal 1953 . . . **Reported 1953 earnings of Bell Aircraft** were up 13.9% over the previous year, reaching $3.5 million. Sales and income were up almost the same percentage, totaling $147 million . . . **North American Aviation** may have to hire more people in order to meet increased F-100 Super Sabre schedules. F-86D modification program will also help to boost the payroll.

AIRLINES

Failure of a push-pull tube of an elevator trim tab on a Continental Air Lines Convair 340, which brought on a non-fatal flight accident, has brought a CAA alert to all field offices, suggesting immediate inspection . . . **Age limit for stewardesses** is going to receive the attention of American Airlines and the Airline Stewards and Stewardesses Association. Pending the outcome, all AA stewardesses hired after last December 1 will discontinue active flying when they reach 32; those hired before then will have no age limit . . . **New Pacific area communications network** for Pan American went into effect on April 1, over radio teletype channels leased from RCA. The system, linking Tokyo and San Francisco, will carry a message between these points in three minutes.

Nacelle of the Pratt & Whitney T34 that powers the Air Force's YC-124B is shown above. The plane is the USAF's first four-engined turboprop transport, with each of its engines developing 5700 horsepower.

tonight

This man could almost reach the moon tonight... for he stands at the brink of a new age in the conquest of space, and he knows this:

If we had to, we could get him there. Given time and urgent need, we could design, build and deliver the total solution to that problem.

An entirely new development in the aircraft industry now makes this possible. It is known as Systems Engineering... a science and a method of developing aircraft, guided missiles and electronic systems not as traditional flying vehicles but as fully coordinated solutions to operations problems.

Today, Martin Systems Engineering is already in full operation, tailoring airpower to tomorrow's needs. Most of the story is under wraps, but you should know this:

If our security requirements should demand the equivalent of an "Operations Moon," the principles of Martin Systems Engineering would be essential to the solution of that problem.

You will hear more about Martin!

CRAFT

THE GLENN L. MARTIN COMPANY
BALTIMORE • MARYLAND

Interview

with

Col. J. Francis Taylor, Jr.

Director of ANDB

• • •

Big Decisions Ahead for Reorganized ANDB

• • •

Col. J. Francis Taylor, Jr., newly appointed director of the Air Navigation Development Board, served as deputy chief of the All Weather Flying Division at Clinton County Air Force Base after the war, and was named division chief in June, 1948. He held this post until September, 1951.

While with the division he was actively engaged in the following projects: automatic flight to England and return; the Thunder Storm Project; the "all-weather airline" which operated between Clinton County Air Force Base, Wilmington, O., and Andrews Air Force Base; and the establishment of radar traffic control at Berlin.

After completion of an Air War College Class at Maxwell AFB, he was assigned to Headquarters USAF as chief of the mobilization division, directorate of plans.

Colonel Taylor is a native of Columbus, Indiana, and a graduate of Miami University, Oxford, O. Prior to World War II, he graduated from both Randolph and Kelly Fields and was assigned to the 1st Pursuit Group, Selfridge Field, Mich.

At the beginning of the war, he was transferred to 8th Fighter Command and was deployed overseas with Command Headquarters in March 1942. He was in charge of theater indoctrination and training for all fighter groups assigned to both the 8th and 9th Fighter Commands. He concluded his tour in the 9th Fighter Command as officer in charge of combat operations for a period including invasion planning and extending to the Battle of the Bulge.

Taylor ended his wartime overseas service with the 8th Air Force Operational Engineering Section and was being redeployed to Guam when the Pacific war ended.

Q. What is your background, is it engineering or operations?

A. I have more flying than engineering experience, but I can't claim to be completely without knowledge in engineering. I have been in the Air Force a little better than 17 years and logged more than 4000 hours flight time, about 600 of this being instrument flight.

Q. One of the major criticisms from the civil and military end of the business has been the handling of air traffic control. Do you have any ideas on what can be done to improve that situation?

A. Yes, I have some ideas, but I think it would be premature to mention them now because I don't know how practical they are. I have been completely divorced from the development side of this business for two years.

Q. What have you been doing in this period?

A. I have been to the Air War College. I recently came back to USAF Headquarters, where I have been working since July.

Q. Have you been doing any flying during the past two years since leaving the All-Weather Flying Division?

A. Yes, I just completed a jet instrument course at Moody Air Force Base two weeks ago.

Q. Do you stay in the Air Force in this appointment, or do you resign and become a civilian?

A. I will remain in the Air Force, but will be on full-time assignment as Director of ANDB.

Q. Will you be responsible to a command echelon in the Air Force?

A. No. While I am in this assignment the Board Members collectively are my boss. I will report to them, and will direct the ANDB program with their guidance.

Q. Do you think the ANDB Director should be a military officer?

A. He could be either a military officer or a civilian. The Board is a joint military and civil operation, and I should think the Director could be either. The last two Directors were civilians.

Q. What happened to the All-Weather Flying Division, of which you were in command?

A. It, in common with many other activities, lost budget support just prior to the Korean War.

The All-Weather Flying Division as I knew it, and the way I would like to remember it, was then what we called the All-Weather Flying Center at Clinton County Air Force Base, Ohio. This organization had to be reduced and was moved to Wright Patterson. With a reduction in size it could no longer maintain its status as a division. It became a branch and was consolidated with Flight Test at that time to become the All-Weather Flight Test Division. It is still active as a part of Flight Test.

Q. How big an operation was it under your direction?

A. We employed roughly 1000 people at the All-Weather Flying Center, combined military and civilian. We normally logged around 1000 hours a month, test time. Normally we had between 30 and 35 aircraft.

Q. Could you give us a brief summary of what the Thunderstorm Project was?

A. It was a means by which measurements were taken inside actual thunderstorms. We flew P-61's—the Northrop Black Widow—aircraft into these thunderstorms at 5000 foot altitude intervals from 5000 to 25,000 feet.

'Defense and Commerce are equal partners on the Board'

All penetrations were made simultaneously, under radar control. Inside the storm a special beacon on the aircraft replied to the ground radar and was readable through cloud and rain clutter. Aircraft would assemble on one side of the storm, fly through it, reassemble, and fly back through it. They often made as many as five penetrations per aircraft.

Aircraft were especially instrumented to record the magnitude of the gusts, the electrical phenomena inside the storm, and what was happening to the instruments (we had a special pilot's instrument panel which was photographed). Among other things we had an observer riding in the rear end of the aircraft who talked into a recorder to describe what was visible to him. I believe we made between 1100 and 1200 flights into thunderstorms.

Q. How was the data put into practical use?

A. A technique for flying in turbulent air was developed and became standard throughout the Air Force. This technique consisted of flying attitude rather than altitude, and beginning the thunderstorm penetration at a high enough speed to prevent stalling but still not so high as to impose dangerous structural loads on the aircraft.

This technique is and has been taught for the last several years at the Air Force Instrument Instructor Pilot School, Moody Air Force Base, Georgia.

Q. As Director of the ANDB, how much are you going to have to do with the TACAN, VOR DME study?

A. As has already been announced, the first phase of this study, which we call the VORTAC evaluation, will be in the hands of a special ANDB committee headed by Milton W. Arnold, Vice President-Operations, Air Transport Association. He and I will work closely together on this problem.

Q. In the announcement of your appointment there was also announced the retention of three scientists to do part-time consulting work for ANDB. Are they to work in connection with a specific project?

A. They are consultants to the top ANDB, but will work principally in connection with the VOR/TACAN evaluation. The scientists are Prof. Jerome Wiesner, director, Laboratory for Electronics, Massachusetts Institute of Technology; Dr. H. R. Skifter, president, Airborne Instruments Laboratory; and Russell Newhouse, of Bell Telephone Laboratories.

Q. Doesn't the appointment of a military director for ANDB leave the military services four votes to only one civil vote and thus eliminate any chance for civil needs to get serious consideration?

A. It is true that the membership is a total of four from the Defense, Army, Navy, and Air Force and one from Commerce, but the ANDB charter covers that. It states that Defense and Commerce are equal partners on the Board and have equal authority and responsibility.

The Board, in all that it does, is advisory to the Secretaries of Defense and Commerce. They share the basic responsibility and they have delegated the authority to this Board to carry out certain functions. The Board itself can't do anything that the Secretary of Commerce or the Secretary of Defense does not want it to do.

Q. What share of ANDB's development funds is being devoted to air traffic control?

A. Air traffic control developments are four to one over other projects.

Q. What is the relationship of the new ANDB Director to the individual Board Members?

A. The ANDB Director is responsible to the five Board Members collectively. They are his boss. They will furnish him general guidance at meetings which are held at approximately quarterly intervals. The Director, in turn, is the boss of the ANDB full-time staff organization. Each of the top Board Members has a direct full-time representative who is a part of the Director's full-time organization.

Q. Would you please comment on the reorientation of ANDB goals?

A. The broad goal has not been changed.

Q. Who is on the VOR—TACAN committee?

A. The VOR-TACAN evaluation committee includes E. C. Wood (Defense); Peter Caproale, (Commerce); Lt. Col. J. L. Wilson, (Army); H. I. Rothrock, (Navy); Col. H. A. French, (USAF); General Milton Arnold, Air Transport Association; Cole Morrow, National Business Aircraft Association; and J. B. Hartranft, Aircraft Owners and Pilots Association (the latter three representing industry).

Q. Do you feel there is much need for a reorganization or reorientation of the goals of the Radio Technical Commission for Aeronautics as expressed by Special Committee 31?

A. I believe that we need clearer statements of our requirements in the light of today's knowledge. The report of Special Committee 31, in which I participated, now is seven years old.

Q. Is it true that the U.S. is taking another look at the British Decca system, particularly as a helicopter aid?

A. Not that I know of. I understand, however, that the New York Airways is seeking permission to evaluate the potentialities of the Decca System for their helicopters.

Industry Views

Q. What is your approach to getting the viewpoint of industry into the ANDB activities?

A. I think one of ANDB's main functions is to utilize the recommendations of the aviation industry. ANDB is a very small organization, as you know. If the actual work of developing these items that are required by the RTCA common system were left to ANDB it would never get done with the staff and facilities that are available. Our job obviously is one of coordinating the ideas, thoughts, and efforts of a great many people, and certainly industry can make very important contributions. Certainly these must be utilized to the maximum.

Q. Do you have any concrete ideas as to what extent the civil operators can utilize the military system, which has been devised with the little consideration for them?

A. From the standpoint of flying within the continental limits of the United States it has always been difficult for me to see how an airplane knew whether it was civil or military. Regardless of the type vehicle or its mission, all aircraft have to know where they are, how to get from place to place, how to fit into the traffic scheme, and how to approach and land in low visibility conditions.

Q. Do you feel that there is such a thing as a common system that can be worked out to the satisfaction of the major segments of the aviation industry—civil and military?

A. I am a little puzzled by your use of "is." I think there "must be" a common system. Whether it is in existence at the moment or whether it is something in the future I

G.E. DEVELOPS 400-AMPERE GENERATOR TO MEET NEEDS OF NATION'S AIRLINES

A compact new 400-ampere generator requiring only six inches of cooling air over a range of 4500-7000 rpm has been developed by General Electric to meet the needs of the nation's airlines.

First application of the new d-c generator is on the Douglas DC-7. All electric power aboard America's newest airliner is supplied by four of the new 30-volt, 400-amp G-E generators.

The new generator (Model 2CM244) has the highest capacity of any wide-speed-range commercial unit of its size (6½-inch frame). Resulting from G.E.'s continuous interest in the requirements of commercial airlines, the new equipment offers these ***exclusive*** features:

- **QUICK-ATTACH-DETACH (QAD)** mounting flange permits installation in minutes instead of hours.
- **CLEARANCE-TYPE SHAFT** absorbs engine drive vibrations and reduces spline wear to insure longer life and reduced maintenance.
- **SHRINK-RING COMMUTATOR** permits higher speeds without commutator distortion to provide greater service life.
- **NEW CORED BRUSH**, a distinct advance in aircraft brush design, eliminates pre-filming of commutator, improves commutation, and reduces commutator temperature.

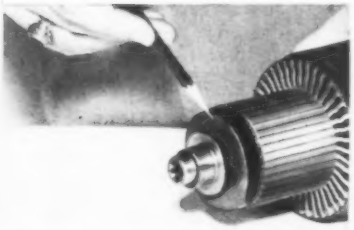
The new aircraft generator also offers these improvements:

1. Silver-plated, cast-bronze brush holder minimizes brush chatter and increases contact efficiency.
2. Solid-steel armature binding bands securely hold end turns and prevent winding distortions.
3. Pre-lubricated clearance-type shaft (internally lubricated) provides for increased operating life.

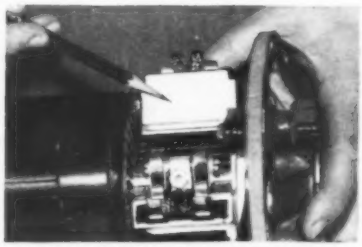
Whether your requirement is a-c or d-c, a single generator, or complete electrical systems, contact your General Electric aviation specialist, or write Section 210-85, General Electric Company, Schenectady 5, New York.

GENERAL ELECTRIC

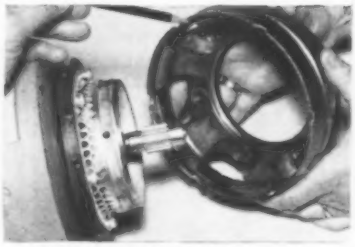
Exclusive features of new G-E generator on DC-7



SHRINK-RING COMMUTATOR withstands higher speeds without distortion to insure long service life.



CORED BRUSH eliminates pre-filming of commutator, improves commutation and reduces commutator temperature.



QUICK-ATTACH-DETACH mounting flange sharply reduces time required for generator removal or installation.

'Traffic must be controlled at higher altitudes'

am really not prepared to say, but I feel that this is something that must be done.

I will even go one step further: it must be done in a manner that makes it useful to all potential users of the air space. I have very definite ideas on the philosophy of such a system, but not on the hardware.

Q. It is our understanding that there is serious consideration of dropping DME as a common system requirement.

A. I am not sure whether you mean the requirement for *presenting* distance-to-go information to the pilot or the requirement for the present *type* of Distance Measuring Equipment as a piece of equipment. We need distance information in the cockpit. I believe the VORTAC Committee will make some recommendations on specific types of equipments.

Q. Do you think there would be any point in the military getting out of the equipment development business as far as navigation aids go and just acting as advisors, and spelling out their needs to the private industries so that you couldn't repeat the TACAN and DME situation?

A. The development laboratories in the military are so well established that it would be a waste of facilities and talent to take this function away from them, but I would think that there is a need for better coordination. Also these laboratories have development responsibilities beyond navigation and traffic control devices.

Q. What do you feel is the major problem facing ANDB today in the way of development work? Is the budget emphasis on air traffic control justified?

A. If air traffic control isn't *the* major it certainly is one of the major problems. I believe it is the major one.

Need Control Soon

Q. Would you elaborate on your personal opinions as to how air traffic control might be improved?

A. Since the war air traffic has been gradually growing upward as well as outward. I feel air traffic must be controlled at higher altitudes.

At present, for instance, the control above 17,200 feet in most cases does not even exist. Yet we right now are flying jet aircraft above this altitude, and, in addition, DC-6's and 7's use these altitudes.

Another thing, we still treat the jet aircraft as a special case. Gradually we have to stop assuming that the jet is a special case; it must be just another aircraft to the system controlling it.

Q. What is your feeling on extending weather minimums for landing below present standards of about 200 foot ceiling and ½ mile visibility?

A. The Navy has several GCA installations which permit 100 and ¼. The USAF has found 200 and ½ to be a workable minimum, from the standpoint of the few times that you would actually need lower minimums. We had no minimums in our operation of the all-weather airline and we had to go below 200 feet only 17 times in two years.

The equipment expense that you have to go to to really operate in that weather has to be weighed against the number of times you are going to use it.

Q. Are there any traffic control problems peculiar to the jet aircraft?

A. I don't believe that the jet has any entirely peculiar traffic control problems, but what has always been desirable for other aircraft is a "must" for the jet. We just haven't faced the problem as we should.

Go back to the old DC-3, with which we so often associate the growth of the scheduled air carrier. The DC-3 would have liked to have had a no-holding procedure, or at least a very short pattern in the terminal area. The jet not only wants one, it has to have one. What might have been a little luxurious for the former military and conventional aircraft has now become an absolute requirement for the jet aircraft.

Q. There are some peculiar aspects to the helicopter's control problem aren't there?

A. Yes, there certainly are. A study of aids has been under way by the Air Navigation Development Board for the past 18 months through its Helicopter Navigation Guidance Group. This group is monitoring a program under which all present types of aids are being evaluated for helicopter operations. If this evaluation shows that new types of aids are needed to meet helicopter problems, we will attempt to develop them.

Q. How do you feel about the accuracy of flying weather as it is reported today?

A. There is no really good system now where a pilot can know what the slant-range, or time to contact, or visibility to runway is from the cockpit. This is the figure we need. The manner in which we describe landing weather is of very little use to the pilot except by interpretation: the 200 and ½ as seen from the ground may mean 500 and ¾ from the cockpit or vice versa. Sperry is doing research for ANDB toward development of a system for determining slant visibility .

Q. Do you feel that all-weather, completely blind landing is possible without automatically coupled approaches; can you do it manually?

A. Not as a routine operation.

Q. Would automatic GCA be a way of consolidating the advantages of ILS and GCA used together?

A. No, because you'd have GCA inspecting itself, which is a very difficult thing to do. I think, although I have had very little experience with automatic GCA, I would rather have one system inspect the other system and not one system inspect itself.

Q. The military, the Air Force in particular, has announced its VOLSCAN automatic traffic control system. What are your views on the intergration of that into the civil-military type of operation?

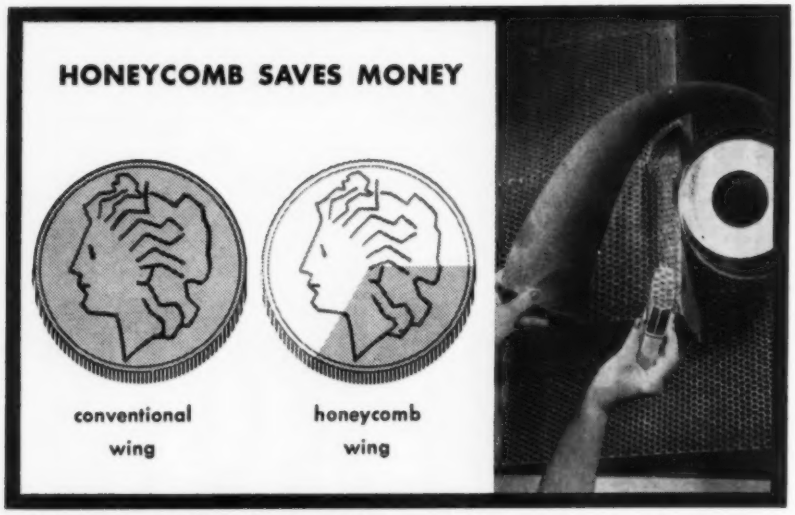
A. VOLSCAN was developed primarily to handle large numbers of military aircraft returning to base in the shortest possible time. It performs this job in admirable fashion and could operate for civil as well as military aircraft.

I do not know its capability to schedule departures intermingled with closely spaced arrivals. However, it would appear that some ability to intermingle both types of movement would be required if it were to be used in a civil-military role.

Q. Do you feel that the modern air traffic control system requires a two-way radio on the part of all users in a high density terminal area?

A. Yes, I feel we have reached that stage of complexity where this is minimum equipment. I am still a student of civil requirements but we have gotten to the point in military traffic that failure to have two-way radio constitutes an emergency. • • •

MORE LEAR AUTOPILOTS WERE PRODUCED IN 1953 THAN ALL OTHER MAKES COMBINED!



COSTS ARE CUT TO ONE THIRD by use of honeycomb rather than conventional wing structure. At right, above, honeycomb core and the foil it is made from.

How Honeycomb Wings Cut Costs

Simplicity and speed of construction reduce costs by two thirds; new techniques developed.

By WALTER A. KILRAIN

WHEN the first squadron of USAF Martin Matadors left for Germany recently, the pilotless bombers constituted three-dimensional proof that a new manufacturing technique had emerged from the stage of tentative development into the realm of assembly-line acceptance. Eighty per cent of the Matador's wing and tail and some internal structure is composed of a honeycomb-like material which has its covering skin bonded to it by an adhesive.

The honeycomb core was produced in an elementary form as early as 1939 and the problem of finding a usable adhesive was solved by 1942. Small scale development work was one thing, however, and production application another. Now, with a growing backlog of design information and manufacturing techniques, Martin can point to some considerable accomplishments:

- **Construction** of the honeycomb B-61 wing can be carried out by semi-skilled workmen at four times the speed of conventional construction.
- **Joining** of the two halves of the wing to their respective center fittings by means of the adhesive bonding eliminates the drilling, tapping, and insertion of 425 bolts.
- **Cost** of the honeycomb wing is approximately one third that of a conventional structure. Largely as a result of this, the cost of the completed Matador is placed by Martin at one half the cost of a fighter of comparable size.

The material that makes such savings possible, as produced by the Honeycomb Co. of America in Bridgeport, Conn., under Martin license, consists of hexagonal cells formed from aluminum foil strips. The foil gauge may vary from 0.0015 to 0.006. The size of the individual cells is generally either ⅜" or ¼". The core's density ranges from two to 30 pounds per cubic foot.

This core fills the entire interior of the Matador's wing. The three sections which form the wings are first sawed to the required airfoil contour (see photo, top of opposite page). The leading edge and trailing edge portions are then covered with aluminum skin, which is attached to the core by means of the same adhesive that holds the individual cells together. This adhesive is applied in the form of Fibreglass mats which have been impregnated with the adhesive compound. The resulting film is laid between the skin and the core, heat and pressure are applied, and the bonding is complete.

PARTS OF WING for B-61 are laid out in front of completed wing. Wing has three sections, plus cast center fitting.

With the leading and trailing edges and the two spars finished in this manner, the center section, still without a skin, is assembled with them in a large bonding press. There the skin is applied to the center section and all the sections (plus the aluminum casting which is the center wing fitting) are joined together simultaneously.

One of the new production techniques developed by Martin consists of the method of bonding. The process originally took seven hours when the heat and pressure were applied in an autoclave, including the time required for loading and unloading, and slow cooling of the wing to avoid warping. Use of an oven reduced the time to five hours, but the entire part still had to be heated, and the butyl rubber bags which were used to apply pressure deteriorated rapidly at the 325° F. temperatures that were necessary.

Martin cut the time to two hours by developing a system whereby the heat is applied by electric blankets that come in direct contact with the skin and which are insulated from the rubber pressure bags (see diagram).

Besides reducing the time involved and avoiding the problem of rubber deterioration, this method can be used anywhere there is a source of 440-volt electric current and air pressure. In case of an emergency, subcontractors could presumably set up shop in any garage, free from the necessity of obtaining ovens or autoclaves.

When Martin began using the first electric blanket unit in April of 1953, the company discovered that the quality of the bond was markedly improved and the strength increased. Eight of these units are now in operation.

A second line of experimentation has produced results which promise a new solution to the problem of obtaining tapered wing skins. Martin's adhesive bonding is used for metal-to-metal joints as well as for joining the honeycomb core to the skin. Consequently the tapered skin of the Matador's wing is produced from standard stock, built into a laminate with three sections, simply by applying the adhesive between sheets of varying thickness and length.

The story of honeycomb as developed by Martin started in 1939, when a research fellowship was set up by Martin at the Mellon Institute in Pittsburgh. The project was designed to investigate sandwich construction, and a wide variety of materials came under consideration. Among those tried out were wood pulp, foam, soda straws, and paper. By 1941 the results were encouraging and the operation was moved to the Martin laboratories.

With the aluminum core well in hand, the adhesive posed a problem. First, it could not be too brittle, but it obviously could not "give" indefinitely under stress. Second, there was the technique of applying it. In liquid form, applied with paint brushes or roller coaters, it was necessary to put on three or four coats in order to build up a satisfactory bead on the edge of each honeycomb cell. Between coats the honeycomb had to be given valuable space for drying.

Application with roller coaters often resulted in each succeeding coat of adhesive merely pushing the preceding one down into the interior of the cell, where it did no good. When this happened the required bead did not form on the edge of the cell, the skin did not adhere evenly, and samples failed in inspection.

Inspection Problem

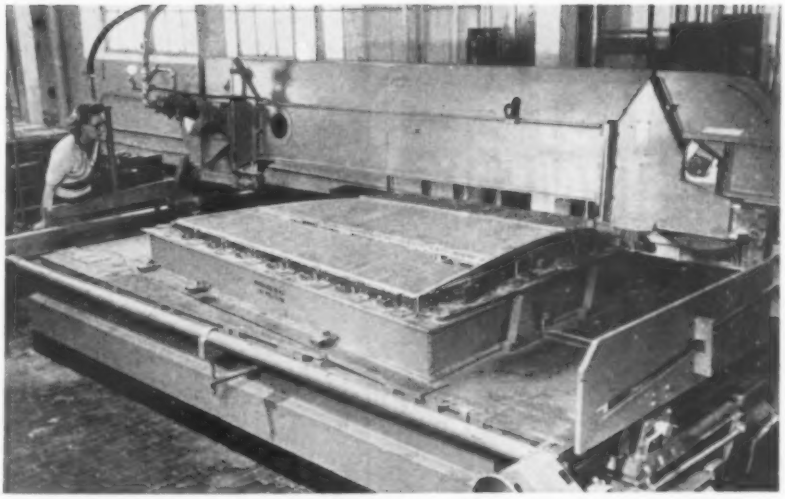
The problem was particularly acute because of the nature of the construction: with the skin sealed on, there is no way to make an inspection of the bonding except by taking sample buttons here and there. For these button tests to be significant it is necessary that the bonding be consistent.

The answer proved to be the impregnation of Fibreglass matting with the adhesive. With the same weight of adhesive Martin achieved a quick and simple means of application, a means of ensuring that the adhesive layer would be consistent, and a peel strength that proved to be three to four times greater than before.

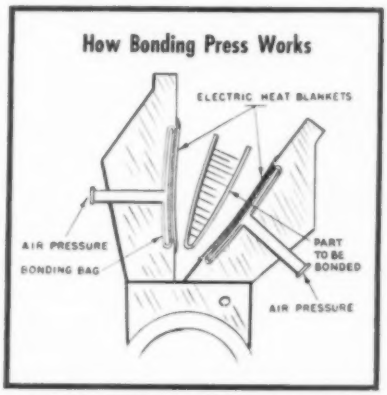
The adhesive matting, known as FM 47 Adhesive Film, is now manufactured by the Bloomingdale Rubber Co. of Chester, Pa.

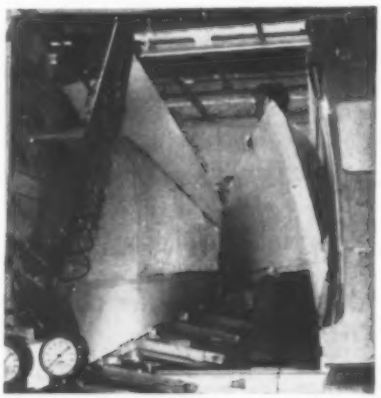
In addition to its use in the Matador wing, horizontal stabilizer, and air ducting, honeycomb construction has also been used in floor panels, bulkheads, and trailing edges in the Matador's predecessor missiles—the KDM-1 and the Gorgon IV, in the 4-0-4, and in the Navy's P5M-1.

If present development work proves successful, the core may find applications not only in such thin airfoils as the B-61 wing and stabilizer but also as a thick but light skin for larger wing surfaces. • • •

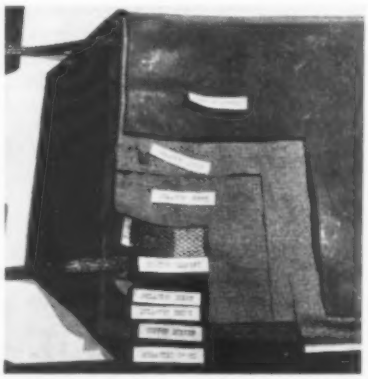


CONTOURS ARE CUT from honeycomb core in first step in production of Martin Matador wing. Band saw, developed by Martin, follows guiding cam visible at right edge of photo. Work is done to tolerance of ± .0001.





SECTIONS OF WING go into bonding press, where they will be joined together, and where the center section will receive its skin, which the worker is shown holding. Heat is applied by electric blankets and pressure by pneumatic bags.



CUTAWAY of electric blanket (left) shows, from top to bottom: coat of silicon rubber which insulates blanket from bonding bag, two silastic sheets, the heating element, two more silastic sheets, copper screening to protect heating element from accidental damage during installation, and final silastic sheet. The last-named sheet presses against the part being bonded. Leads for the heating element extend off to the left. In photo at right is shown a mobile control panel, used to control heat in bonding press at six thermocouples.

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POSITION INDICATOR unit is shown under test.

USAF Pilots Get Ford's New Computer

By Joseph S. Murphy

THE U.S. Air Force has a new airborne dead reckoning navigation system that will give its pilots a direct and accurate cockpit reading of ground position in degrees and minutes of latitude and longitude at a glance. The device is called the AN/ASN-6 Computer Set—Latitude and Longitude, or Ground Position Indicator, and is now in production at the Ford Instrument Co., a division of the Sperry Corp., located in Long Island City, N. Y.

Lieske

Development of the ASN-6 was carried out by Ford under contract with the USAF Wright Air Development Center Communications and Navigation Laboratory. The project at Ford was supervised by George A. Lieske.

The complete installation of the GPI weighs only 45 pounds. Its four major components—an indicator, computer control, computer, and amplifier—together occupy only 1.3 cubic feet of space in the aircraft. The system operates entirely from data fed into it from instruments solely within the airplane or by the pilot, and requires no other ground signals nor air-ground communications.

To set it in operation the pilot merely cranks his wind speed, wind direction, and magnetic variation into the computer control before departure and then sets his take-off latitude and longitude on the counter type indicator. Once airborne, the GPI system does the rest, continuously calculating and displaying his changing position.

Basically the ASN-6 is an airborne analog computer which receives its variables both automatically and manually to calculate the ground position of the airplane.

Magnetic heading, true airspeed, and compass transmission error correction are three of the variables that are fed into the computer automatically. The system operates from a Type J-2, J-4, or N-1 slaved gyro magnetic compass for heading information, and from a Type A-1, A-2, or C-2 true airspeed computer and transmitter for airspeed information.

Besides these automatically introduced variables from aircraft instrumentation, the GPI is manually fed wind force, wind direction, and magnetic variation by means of dials on the computer control unit. Control knobs on this unit are connected to transmitters to convey the functions of these variables into the computer.

Major components are:

COMPUTER CONTROL

• **Indicator** (ID-389): A panel-mounted unit that receives latitude and longitude change information from the computer by means of synchro transmission for display on veeder type counters. A pair of switches, one operating a latitude and the other a longitude slew motor, permit initial setting of exact ground position at departure.

• **Computer Control** (C-1316): Provides three dials for manual introduction of wind force, wind direction, and magnetic variation into the system. The dial for wind force (speed relative to the ground) is of the counter type.

• **Computer** (CP-188): A 16-pound analog computer unit containing 800 separate parts is the brain of the system that receives the variables from aircraft instruments and those manually dialed into the computer control. By means of resolving, differential, and integrating mechanisms, it calculates changes in latitude and longitude and electrically transmits them to the indicator.

• **Electronic Control Amplifier** (AM-916): Houses the power supply, time standard amplifier, and five servo amplifiers which serve the computer. The power supply requires 115-volt, 400-cycle, single-phase, a-c current as well as 28-volt, d-c current. The a-c load is approximately 230 va at a 0.8 lagging power factor: d-c draw is about 11 watts.

One of the major design features of the GPI system is the extreme miniaturization built into the airborne computer. Best examples of this are the 1/5 watt servo motor used, compared with 10 watt units in larger computers. The computer differential has been reduced to about the size of a paper clip, and the integrator—normally a bulky component—is a 1½" disc in the ASN-6.

Versatility of the indicator design is emphasized by the recent announcement by the Air Coordinating Committee that it is adaptable for direct use in the Navarho long distance navigation system being backed by the U.S. in the International Civil Aviation Organization as the most promising for standardized use in future global air navigation.

Although the Air Force specification for the ASN-6 called for a system that would operate at aircraft speeds between 70 and 800 knots and winds up to 200 knots, the Ford company is now developing two other models. One, a slow speed version, is being designed for the below-70-knot range and will be particularly adaptable for airship and helicopter operations. Another model is intended for supersonic aircraft and guided missiles.

• • •

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Note to Dr. Watson, WHEREVER you are: Rosemary Payne is 22, 118 lbs., 5'7", with brown hair and eyes.

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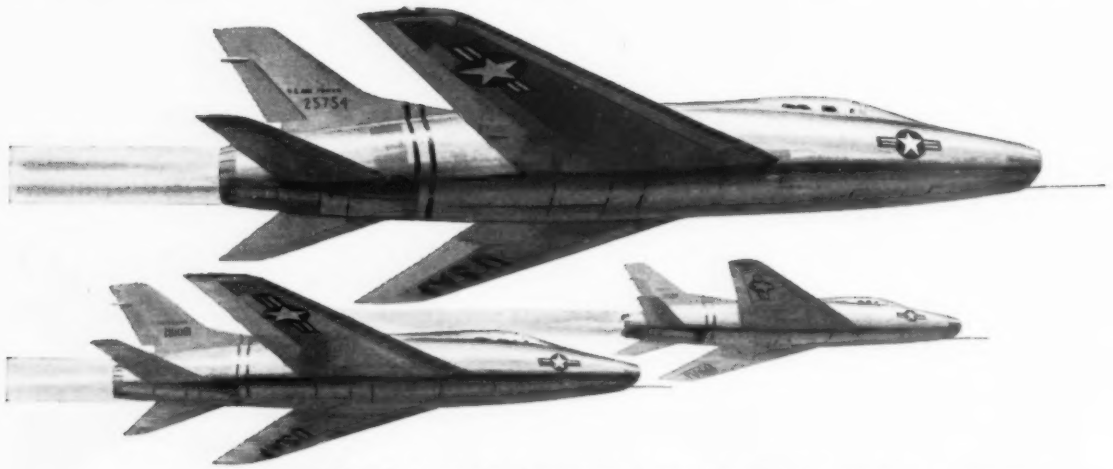

America's first operational supersonic fighter...the F-100 Super Sabre...surpasses Mach 1—the speed of sound—in normal, level flight. Mach, (pronounced "mock"), is the only accurate way of expressing jet plane speeds, because the speed of sound varies with the temperature and the altitude at which a plane is flying. So, a jet flying at Mach 1 is flying at the speed of sound...no matter what altitude or temperature. The sound of these powerful jets overhead is your assurance of security in the skies.

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West Coast Talk

By Fred S. Hunter

Anent the XFY-1 and the XFV-1, the Navy's two experimental vertical take-off fighters:

Enterprising Los Angeles television station rounded up Convair's **J. F. (Skeets) Coleman** and Lockheed's **Herman R. (Fish) Salmon** to give its viewers the reactions of the men who will fly these new Gee Whiz jobs. Coleman led the cheering with strong words like these: "The XFY-1 has unlimited potentialties" . . . "It is going to be as fast as any airplane today" . . . "Its change of pace will make it superior to any airplane today." Salmon thought Lockheed's ship would be pretty good, too. Better than Convair's, he opined with a large grin for the camera and an eye, no doubt, toward a raise in pay. What struck both pilots most, they indicated, is the control the VTO planes will have because of their power.

•

Difference between Skeets Coleman and Fish Salmon is that Skeets asked for the opportunity to test fly the XFY-1 and Convair gave it to him, while Lockheed asked Fish if he wanted the opportunity to fly the XFV-1 and Fish took it . . . Coleman is in the Marine reserve (just recently promoted to lieutenant colonel, incidently) and has been putting on time in helicopters, getting the feel of vertical flight characteristics in preparing for the VTO work. After some 50 or 60 hours in the helicopters, he is convinced the VTO configuration is much the better. Helicopters are too complicated, he declares. The VTO's are much simpler.

•

One thing about the VTO fighters: They will undoubtedly introduce a new hazard for pilots. Falling off ladders . . . And no matter what name the Navy may select for the XFY-1, it will always be the "Pogo Stick" in San Diego. Convair workers have never called it anything else since construction started on it two years ago.

•

The ways of security continue strange. Maj. Gen. Al Boyd, chief of the Wright Air Development Center, discussed the MiG 15 before members of the Institute of the Aeronautical Sciences in Los Angeles. It was open only to those who had been cleared for confidential information. Then on the day of the meeting the classification was upped to secret. When a reporter asked Gen. Nathan F. Twining, the Air Force chief of staff, why a talk on the Russian plane should be classified at all he appeared nonplussed. "Maybe," cracked one cynic, "what we are trying to hide from the Russians is that we don't know as much as they think we do."

•

Reports that Douglas has a prototype of the XC-132 under construction are incorrect. This project is still in the mockup stage. There seems to be considerable confusion between the Santa Monica division's XC-132 and the Long Beach division's C-133 due to the fact that both are large-scale logistics transports. The C-133 is designed to make use of presently available turboprop power. The XC-132 is designed around a future engine.

•

WEST COAST MISCELLANY—The F-94's which will be built by the Kawasaki Aircraft Co. in Japan under license from Lockheed will be the earlier A and B models, not the F-94C . . . Rohr Aircraft Corp. has received a Douglas order for $3,000,000 more of DC-7 power packages . . . Woody De Silva was guest of honor at a luncheon commemorating his 25th year with the Los Angeles International Airport, but Gordon Stanton of the rival Lockheed Air Terminal stole the show at the microphone . . . Edwards Air Force Base test pilots are boning up on instrument flying to evaluate all-weather weapons systems.

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Pre-View Report to the Aviation Industry

Collins Aeronautical Research Laboratories are completing final tests on two revolutionary avionics developments.

- *Collins MC-101 Mag. Amp. Gyro Stabilized Compass*
- *Collins AP-101 Automatic Pilot*

Flight-test reports on these new Collins developments indicate a major step forward in automatic flight. Watch for further details!

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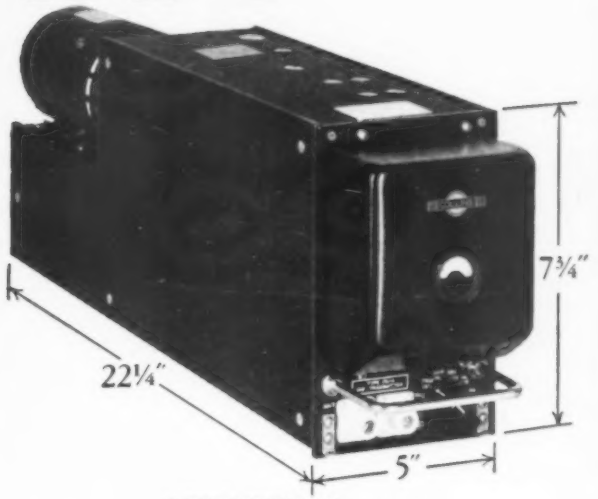

SPECIFICATIONS

Frequency Range	118.00 to 135.95 mc
Nominal Power Output	25 watts
Power Source	27.5 volts DC with negative lead grounded
Case Dimensions	22¼" long, 5" wide, 7¾" high
Weight	25 lbs.
Temperature Range	−40 C to +55 C
Altitude	Pressure equivalent to 35,000 feet
Audio Input	100 ohm carbon microphone; 0.25 v rms input at 1000 cps
Front Panel Controls	Sidetone level adjustment and antenna trimmer
Frequency Stability	The carrier frequency does not deviate from the assigned channel frequency by more than 0.005% under service conditions
Audio Frequency Distortion	Less than 10% at 90% modulation

51X 360 Channel Receiver

51X 360 Channel Receiver one-half ATR size airborne companion to the 17M-1 or the 17L-4 360 channel transmitters. The 51X is not an alteration of existing equipment but is an entirely new design providing for ease of maintenance and through use of new type crystal saving circuits, allows multiple use of crystals. ARINC tubes are used throughout. 3 microvolt sensitivity is provided and 50 kc spacing guarantees complete VHF coverage for present and anticipated needs with 360 available frequencies.

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Examiner Would Apply 'Offset' Both Ways

A new twist to the controversial "offset" theory was applied by a CAB Examiner late last month when he raised the possibility of making up domestic earning deficiencies by higher international mail pay. Until then the offset policy, as set down by the Supreme Court, was seen as applying excess domestic earnings against international mail pay needs.

The new version was presented by Examiner R. Vernon Radcliffe in his report in the Trans-Atlantic Final Mail Rate Case. Although he said further CAB proceedings should be held on the offset matter, he reasoned that TWA domestically since 1946 had an earnings deficiency of $1.4 million, which should be made up through increased international mail pay.

The same reasoning applied to Pan American's Pacific and Alaska operations, which, the Post Office argued, had excess earnings of $5 million in 1951 and 1952 which should be offset against trans-Atlantic need. Radcliffe said the international rates are temporary since 1946 and Pan Am realized a net deficiency in the Pacific and Alaska divisions for that period of $1.2 million.

Meanwhile, he made the following recommendations for Board action:

- **TWA should be granted** an additional $7,426,000 for the period February 5, 1946, through December 31, 1952, and its "future" annual rate beginning with January 1, 1953 should be $8,507,000.
- **Pan Am's total trans-Atlantic pay** for the period January 1, 1946, through December 31, 1952, should be decreased by $304,000 and for the period beginning January 1, 1953, annual pay should be $15,915,000.
- **American Overseas Airlines** (absorbed by PAA in September, 1950) should be granted an additional $5,898,000 for operations conducted from January 1, 1946, through September 25, 1950.

Also proposed was a new rate of return for PAA and TWA, reflecting debt and equity components of their financial structures.

The average rate for both carriers for the future would be 9.3% based on an average debt component of 34% and an equity factor of 66%. A carrier would get a rate of return of 3.5% on the debt factor and 12.3% on equity. In the past, a straight 7% return on investment was recognized.

USAF Reveals New Navigation System

Navarho, now in development, will be urged as standard global system; first trials due in 1955.

IN A TOP-LEVEL MOVE on the eve of the International Civil Aviation Organization's 5th Communication Division session, which got under way in Montreal recently, the U. S. Air Force erased the security label from its Navarho long distance navigation system. The U. S. then immediately began to lay the groundwork for its eventual adoption in ICAO as the standard system for global navigation.

Navarho, developed by Federal Telecommunications Laboratories, Inc., of Nutley, N. J., for the USAF, is a rho-theta (distance measuring-azimuth) navigation system operating in the low frequency (90-110 kc) band. It has a range of about 2000 nautical miles over land and 2600 over water and will give the pilot his fix in latitude and longitude, his distance to destination, and the course that he has to fly.

According to details just released by the Air Coordinating Committee, only 50 Navarho stations would be needed for world-wide coverage. Each installation would serve an estimated 20-million-square-mile area. Station cost, including real estate (about 1¼ square miles), power, etc., would be approximately $1,000,000 and annual maintenance about $50,000.

Airborne Navarho equipment, ACC estimates, would weigh about 70 pounds and cost close to $4500. This would include a computer that would automatically translate the distance and bearing information received into directly usable navigational information. This same computer would also have built-in dead reckoning features that would make this information available for a period of 30 minutes or more without radio contact.

Main advantages of Navarho over Consul and Loran systems, which are now in use and which have been leading contenders in the past for international standardization, are its longer range, ability to provide global coverage, and the fact that it provides 360°

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coverage from a single ground station. It is accurate to within 0.5°—1.0° at 2000 nautical miles in bearing measurement, and in distance measurement to within one per cent of the distance.

To use Navarho with the computer installed the pilot needs only know the frequency, latitude, and longitude of the station he intends to use, and the latitude and longitude of his destination and starting point. For cockpit presentation, the indicator portions of the USAF's new Ground Position Indicator (see story page 30) are adaptable to Navarho.

Here's how the system operates: The ground station is made up of three 625 foot high antenna towers located in an equilateral triangle 0.36 wavelengths on the side. Three 15 kw transmitters with standby provisions are required. The towers are excited in pairs for a duration of 166.7 milliseconds. The keying cycle consists of four pulses per second, one from each pair of towers and one from all towers excited simultaneously.

For example, the pulses are transmitted in a sequence such as A, B, C, and D, where A is the pulse from towers 1 and 2, B from towers 2-3, C from 3-1, and D is a synchronizing pulse from all towers simultaneously. During pulse D two frequencies are transmitted at the same time to serve a dual purpose. One is to supply synchronizing data so that pulses A, B, and C may be identified, and the other is to furnish range information.

Accurate measurements are taken to keep the radiated energy from each tower exactly equal in phase and amplitude during the transmission cycle when two towers are excited at the same time. In this way a modified figure eight radiation pattern is obtained, and during the cycle three figure-eight patterns are transmitted in sequence, each rotated by 60°, followed by a fourth pattern which is omni-directional.

The signal received by the aircraft equipment consists of three pulses varying in amplitude and one pulse containing two frequencies. The bearing information is then obtained by making relative measurements between the amplitudes of the three pulses, and the distance data by measuring the phase difference between the two frequencies in the D pulse and that of a highly stable airborne frequency that is locally generated.

The results are fed into the computer to establish the fix and automatically present it to the pilots in a direct usable form.

Today Navarho is still a development system. According to the present schedule, development trials will not start until 1955 and operational trials in 1958-59. Production of Navarho for operational aircraft is not anticipated until 1960, and its use on a fleet-wide basis will probably not take place until 1963.

• • •

PAL Drops Routes to U. S., Europe, Japan

Philippine Air Lines on March 30 suspended its long range international operations (to the U. S., Europe, and Japan) and is to sell its four-engine fleet of two DC-6B's and one DC-6. From now on it will concentrate on the development of Southeast Asia regional services and domestic operations.

The retrenchment follows "adoption of a new aviation policy by President Ramon Magsaysay reducing the scope of the company's operation in accordance with the objectives of the government to effect rigid economy in government and to carry on its program to raise living standards throughout the country," according to PAL President Andres Soriano.

Under this policy, "funds needed

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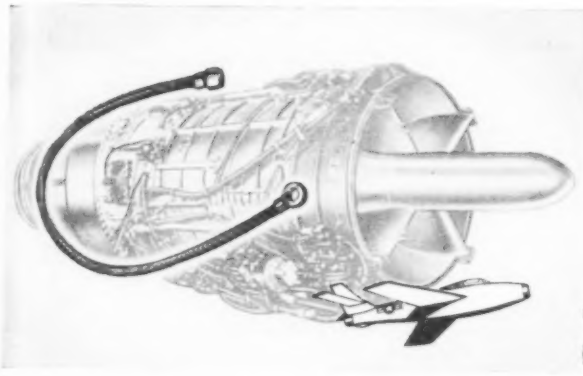
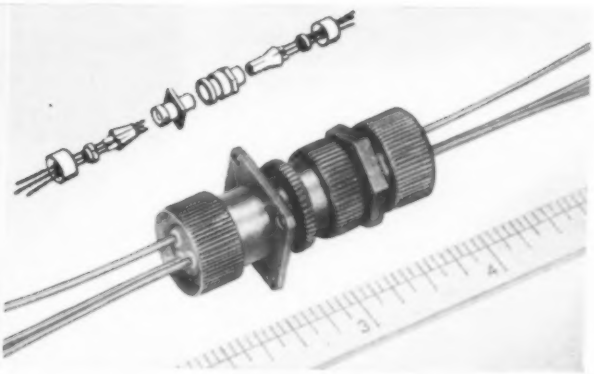
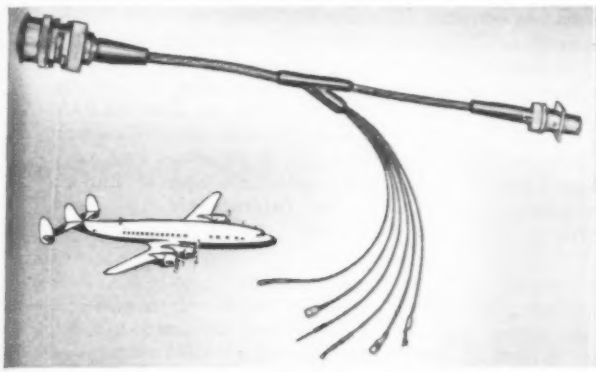


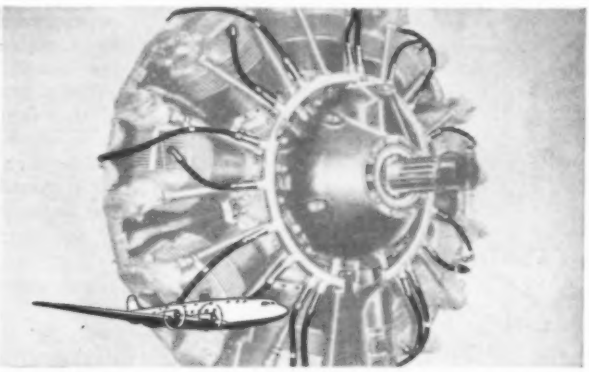
DEPENDABLE FUEL FEEDING. Fuel for the J65 Turbojet Engine is injected to the burners through Titeflex® flexible metal hose. Tough, lightweight Titeflex—tested for temperatures from —70°F. to +600°F. and for pressures up to 500 psi—reliably conveys fuel to engine nozzles; withstands vibration and rough use; is excellent for complex configurations.



FAILURE-FREE INSTRUMENTATION. Designed primarily for instrumentation service at high altitudes, lightweight Titeflex 07 Connectors are pressure-tight and resistant to moisture and corrosion. Plug and receptacle, mated, weigh only ⅔ of an ounce! Special sizes, meeting AN Specifications, can be made with 2 or 3 pins and AE threads—and adapted to your design.



CUSTOM WIRING SYSTEMS. Titeflex specializes in designing and building special "packaged" wiring systems and component assemblies for today's complex aviation and guided missile installations. These may be jacketed with protective silicone or other compounds—and Titeflex Special Connectors used as integral parts solve complex wiring problems.



RADIO SHIELDING. Titeflex Harness for reciprocating engines is our specialty. Titeflex makes a wide range of standard ignition harnesses meeting rigid aviation specifications—can also supply component parts, such as serviceable leads for military and commercial aircraft. Titeflex application on Wright R 1820 Engine includes harness and leads.

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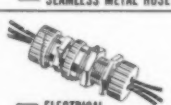

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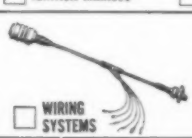

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by PAL for new long range equipment to keep the airline competitively strong, and an allocation for air mail carriage, will be channeled into the government's program for the improvement of domestic airports, thereby strengthening the national defense in case of emergency," it was stated.

PAL will use its Convair 340 fleet to develop domestic and regional operations, and also plans to operate helicopters domestically.

PAL hopes to obtain overhaul and maintenance contracts from foreign operators and to become general sales agent for more companies. A more intimate association with KLM Royal Dutch Airlines is likely, although negotiations by both KLM and Transocean Airlines for the continuation of PAL's long-haul international operations were not successful.

The Philippine government has granted KLM full traffic rights at Manila and reportedly may ask foreign governments to transfer to the Dutch carrier PAL's rights at points on the Manila-Europe route.

PAL reported a net profit of $819,398.90 for 1953, as compared with $433,521 for 1952. International operations resulted in a net operating loss of $542,453 (as compared with a profit of $601,846 for 1952).

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Extra Section

By William D. Perreault

IN A RECENT SPEECH on Defense Department economies, **Roger M. Kyes**, retiring Deputy Secretary of Defense, pointed up some interesting examples of what lack of standardization can do to the military supply problem. The military services stocked 74,000 types of bearings, Kyes said, when 21,000 types would do. They stocked 5000 different electron tubes, which will be whittled to 192 types "by elimination of duplication and unnecessary variety." The study also showed that 100 different sizes and types of screwdrivers were sufficient, permitting 700 types to be eliminated.

•

"The Common Man—Up in the Air," Howard G. Kurtz, Jr.'s study of airline passenger reactions and the psychological factors which underlie them, has now passed the 75,000 mark in distribution, a record we think is unduplicated in this field. Originally written for the Flight Safety Foundation, the remarkably lucid account of passenger reaction to everyday flight situations went to 18,800 people in its original form; to 37,324 more when the International Air Transport Association took over distribution; to another 3000 when the Military Air Transport Service made it required reading for virtually all their flight personnel including pilots, stewards, etc. Later ALPA's house organ, the *Air Line Pilot*, boosted the total printing another 12,900; then Panagra distributed 500 to their flight crews. Pan Am's Latin American Division printed 2000 copies in a Spanish edition; the Italian-language magazine *Ciampion Interairport* reproduced it, and inquiries are still being generated.

•

Scandinavian Airlines' public relations department recently sent us a set of booklets titled *Vi Flyver (We Flyers)*, which it distributes to school students throughout the Scandinavian countries to keep them informed and interested in aviation activities. Edited by **Per Mortensen**, SAS's public relations director, the well illustrated pamphlets spice information on all phases of aviation (helicopters, weather, maintenance, navigation, aircraft, etc.) with humorous cartoons, information on stamps, a little aviation history, etc. It appears to be a unique monthly in air age education.

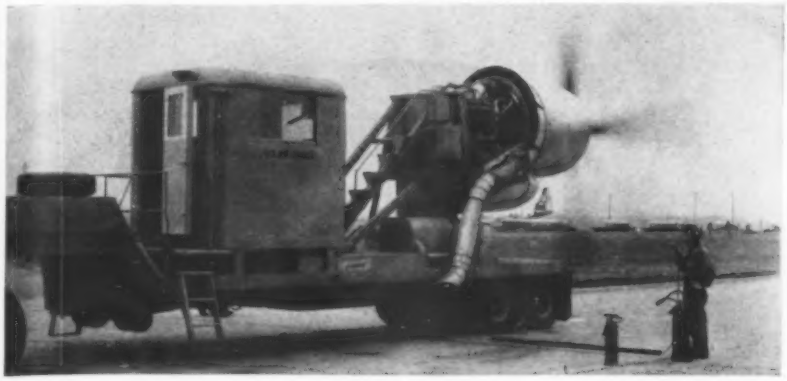
•

United Air Lines' technical report on 5.5 centimeter airborne radar carries an interesting human angle. UAL Captain George Henderson, test pilot on the project, had never used airborne radar before. He admits that initially he carried on something of a contest with the radar, pitting its indications against his own suspicions gained from years of piloting experience. He now admits that nine out of ten times the radar will be more accurate than the experienced estimate. Henderson feels that after a pilot has seen the general structure of a small line squall 125 miles away accurately plotted on the radar scope he becomes a disciple of radar.

•

Dr. Howard K. Edwards, Medical Director for Eastern Air Lines, has accumulated some useful statistics on the aging pilot. He recently presented them to the Aero Medical Association during its convention in Washington, D. C. His principal conclusion is that EAL's retirement program for pilots, calling for retirement at 60, is sound. Pilots have no basic problem keeping healthy this long. He wouldn't say as much for aviation executives, who, EAL's experience shows, should have more medical attention to insure continued health as they get older. EAL has analyzed the medical reports on their top 40 pilots, 30 of whom they had comparable data on for 12 years ago. There was remarkably little change. Average weight increased from 167.5 pounds to 170, average standing pulse dropped from 77 to 75, average blood pressure increased from 112/74 to 120/74. They are all passing their physicals. Meanwhile average solo flight time has been raised from 12,250 hours to 20,500 hours.

Maintenance Bulletin Board



New mobile engine test stand adopted by USAF Air Materiel Command is patterned after types used by civil airlines (AMERICAN AVIATION, November 10, 1952). Test stand and control room are on a 25-foot trailer and accommodate Pratt & Whitney R-4360 engines with propeller installed instead of test club. Unit now in operation at Westover AFB, Mass., is used to check built-up engine packs prior to shipment overseas.

Sperry Opens New Servicing Center

Sperry Gyroscope Co. has opened a new aeronautical center at MacArthur Field, L.I., for the servicing of its flight and engine instruments and autopilots used in corporate and utility aircraft. The center is also equipped to handle special work beyond the scope of routine maintenance on military and commercial airline transports.

Equipment at the center includes complete test fixtures, Instrument Landing System facilities in constant operation for flight checks, and the needed power supplies for ground checks. Trained personnel from the Sperry Flight Research Department are available to check radio communication and navigation equipment.

New Fire Safety Standards Proposed

Action on six new or revised aviation fire safety standards has been set by the National Fire Protection Association for its annual meeting at the Hotel Statler, Washington, D. C., May 17-21.

Preliminary texts of standards to be discussed are now available from NFPA at 60 Batterymarch St., Boston, and include: Standard on Aircraft Hangars (50¢); Fire Extinguishers for Aircraft Crew and Passenger Compartments (15¢); Fueling Aircraft While on the Ground (35¢); Safe Practices for Aircraft Fuel Tanks During Certain Maintenance Operations (25¢); Static Electricity in Aircraft Operations and Maintenance (15¢); and Suggested Aircraft Rescue and Fire Fighting Equipment for Airports (50¢).

CURVED VANE sections deflect B-47 jet exhaust blast.

Boeing Adopts B-47 Jet Exhaust Fence

Boeing Airplane Co.-Wichita Division has adopted a specially designed steel fence to combat the problem of jet exhaust during ground operation of B-47 bombers on the flight line.

Fences are located about 100 feet back from the aircraft and employ curved vane sections to deflect the jet blast from horizontal to vertical. Units are produced by Armco Drainage & Metal Products, Inc., of Middletown, Ohio.

PLASTIC-FILLED BAG speeds X-ray inspection output—eliminates costly jigs.

Plastic Bag Speeds X-Ray Inspections

Faster inspection of irregularly shaped jet engine parts at Solar Aircraft Company's Des Moines, Iowa, plant is being realized by the use of Flexi-Cast, a specialized type of molding equipment originally developed as a means of immobilizing patients undergoing certain types of medical treatment.

A development of the Picker X-ray Corp., Flexi-Cast consists of a thin-walled rubber bag filled with fine plastic granules and equipped with a portable electric vacuum pump. In its normal state the bag is limp. As air is evacuated by the pump, the bag assumes a putty-like consistency for molding to a desired shape. Once formed, further air evacuation makes the bag and its contents rigid in that shape.

Advantage of this type of equipment is that it virtually eliminates the need to build special jigs or other supports to hold parts undergoing X-ray inspection. At Solar, where a high percentage of parts produced use welds, forgings, or castings that require X-ray inspection, its use has tripled inspection output on certain parts.

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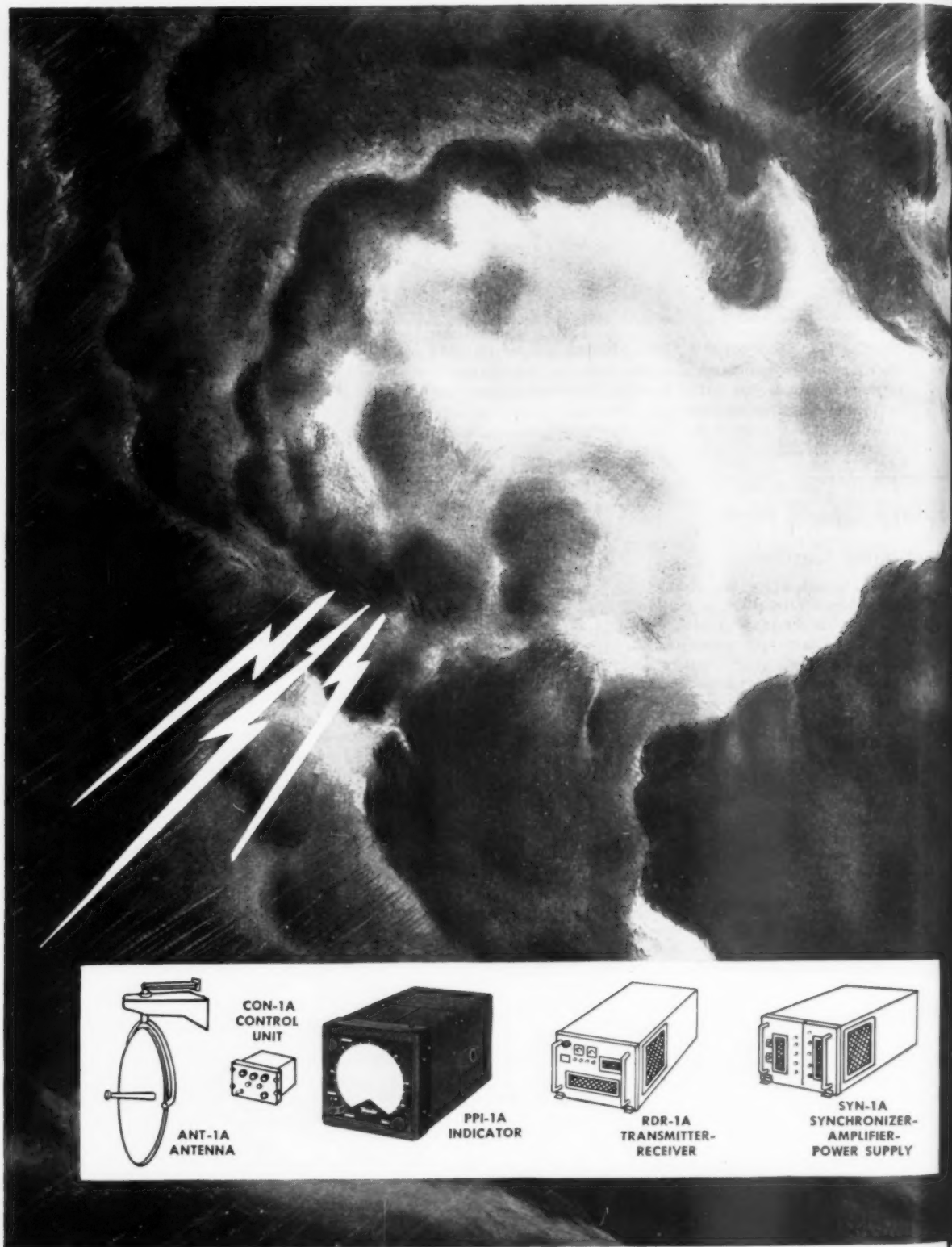

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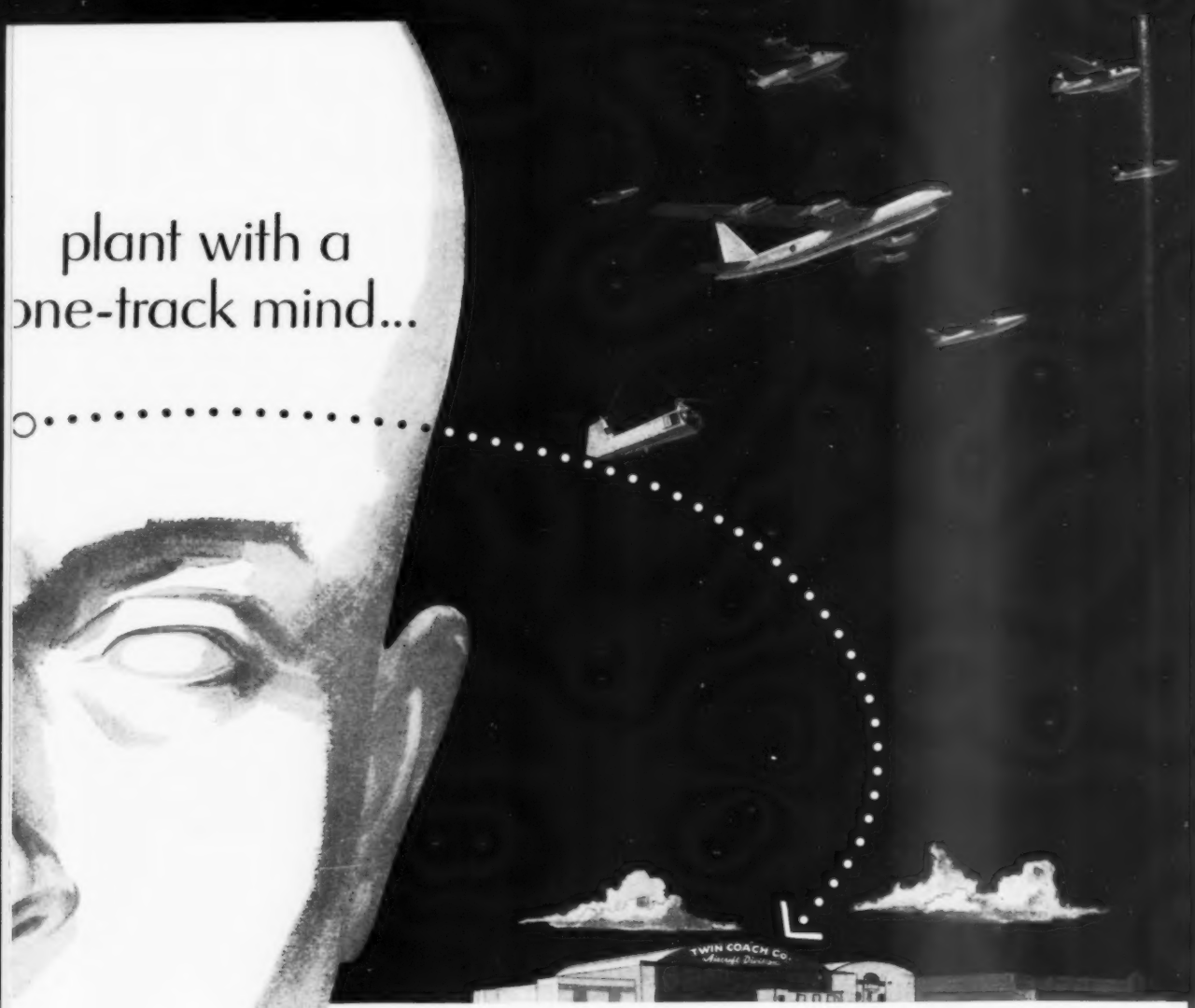

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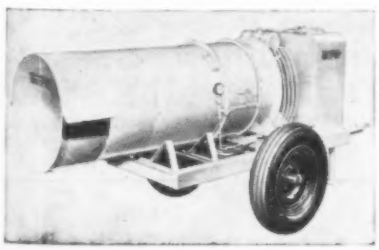
New Products

New engine pre-oiling cart designed and marketed by Durham Aircraft Service, Inc. of Woodside, N. Y., protects against dry starts in newly overhauled engines. Unit features internal recirculation when not in use to assure proper oil temperatures for pre-oiling, and a gauge-valve pressure control at the engine inlet hose.

Temperature Computer. An automatic arithmetic average temperature computer for use in engine test cells, aircraft heat exchanger flight testing, or other laboratory work involving five or more thermocouples has been placed on the market by Aero Research Instrument Co.

One model computer gives an instant average temperature of from 5 to 20 thermocouples; another will accommodate up to 30 thermocouples and can be installed so that each thermocouple may be observed, or the average reading taken.

Address: **Aero Research Instrument Co.**, Dept. AAP, 1901 N. Hermitage Ave., Chicago 22, Ill.



Hangar Heater. A mobile heater capable of producing from one to four million BTU per hour output burns low cost fuel and requires no preheating. Called the Bes-D-Frostr, its odorless, fumeless, clean operation is said to permit use in confined quarters with no flue required.

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Address: **Besler Corp.**, Dept. AAP, Oakland, Calif.

Lord Mount. A center-bonded aircraft cowl mounting promising large savings in line maintenance costs prevents tension breakdown under high radial loads and uses a new elastomer having far greater resistance to oil and ozone than that previously used.

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Address: **Lord Manufacturing Co.**, Dept. AAP, Erie, Pa.

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Address: **Kahn & Co., Inc.**, Dept. AAP, 541 Windsor St., Hartford, Conn.

Technical Literature

FITTINGS AND HARDWARE: "In-stock" bulletins on aircraft fittings and hardware. Prepared by DuMont Aviation Assoc., Long Beach, Calif., on a weekly basis.

MICROWAVE: A 12-page brochure on microwave communications equipment for industry, public and government services. Collins Radio Co., Cedar Rapids, Ia.

EXECUTIVE INTERIORS: A four-color pamphlet has been prepared by AiResearch Aviation Service Co., division of The Garrett Corp., Los Angeles International Airport, Los Angeles 45, Calif., to describe its custom-designed interiors for executive aircraft.

TECHNICAL PAPERS: Publication II titled "Organisation Scientifique et Technique Internationale du Vol A Voile O.S.T.I.V.", containing papers presented at the fourth congress at Madrid in July, 1952. Available through the Secretary of the OSTIV, 3 Kanaalweg, The Hague, Holland, for 3.80 guilders (U.S. $1.00).

AIRPORT FACILITIES: A brochure describing the facilities of Broome County, N. Y., Airport is being circulated by the Broome County Dept. of Aviation.

MANUFACTURER'S STORY: "Beechcrafts at Work" is the picture story of the Beech plant and the uses of the firm's civil and military aircraft. East Central Ave., Wichita, Kans.

DYNAMOMETERS: A 16-page, two-color book details the complete line of liquid-cooled, absorption, motoring, universal, and special-purpose dynamometers manufactured by the Dynamatic Division of Eaton Manufacturing Co., 3300 14th Ave., Kenosha, Wisc.

ENGINEERING SERVICE: An 18-page brochure presents aeronautical techniques and devices used by All American Engineering Co., Wilmington, Del., for such projects as air-sea rescue operations; blimp operations; aircraft carrier practices; aircraft cockpit environments; and others.

SWITCH ASSEMBLIES: Data sheet #69 deals with enclosed reset switch assemblies. Micro Switch, division of Minneapolis-Honeywell Regulator Co., Freeport, Ill.

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CAB Proceeds with Rules For Flight Engineers

The Civil Aeronautics Board has flatly refused the eleventh hour requests of the Air Transport Association and Air Line Pilots Association for a postponement of four specific rules in new CAR Part 40 affecting flight engineers. However the Board did consent to study an ATA petition for deletion or amendment of the rules.

The ATA petition was filed with the Board four days in advance of the April 1 effective date of revised Part 40 and followed an informal meeting of top airline operations officials with CAB members Denny, Ryan, and Gurney to discuss recent developments in the pilot-flight engineer relationship issue.

The ATA petition seeks:

• **Elimination** of current requirement (40.261 d) that one other crew member must be qualified to function as a flight engineer in event of illness or other incapacity.

• **Recognition** in 40.263 of an airman holding a valid commercial pilot's license and qualified on the airplane to occupy the F/E position without also holding a flight engineer's rating. The decision sought here by the airlines concerns whether the third crew position is to continue to be assigned to a separate craft (i.e. engineer vs. pilot).

• **Acceptance** of airline-approved and CAA-designated check pilots as being qualified to flight check any other member of the crew, including flight engineers. Contention is that current Part 40.280 (b) will render ineffective any report by a pilot which reflects on the capabilities of a flight engineer.

• **Extension** of the six-month flight engineer recent-experience requirement (40.307) to 12 months and elimination of a stipulation that the flight engineer check must include a flight check.

The ATA petition warned that the provisions of current rules have brought about an unfavorable cockpit atmosphere, which is endangering the safety of airline operations. The document referred to an Eastern Air Lines pilots' master executive committee request for circulation of a strike ballot by the Air Line Pilots Association because of company failure to qualify all pilots as flight engineers.

Also mentioned was a March 16 letter from the president of the EAL chapter of the Flight Engineers International Association to all Eastern pilots indicating that the engineers considered themselves to be standing on the threshhold of a "bitter dispute" unless the pilots decide on "peace and cooperation."

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People

MANUFACTURING

Lawrence M. Limbach has advanced from works manager to vice president of manufacturing of Ryan Aeronautical Co.

Clarence Carruthers, head of the Independent Aeronautical Dealers Association, has been elected president of the Hydraulic Starter Corp.

Elliott Daland has resigned as vice president of Piasecki Helicopter Corp. in charge of research and development. He will continue with Piasecki as an engineering advisor.

Edmund B. Parke, former general manager of the Aircraft Products Division of Air Associates, Inc., has joined the manufacturing department of the Fairchild Engine Division, Farmingdale, Long Island.

Carl L. Sadler has been named to head the newly created division of Sundstrand Machine Tool Co., Sundstrand Aviation. Sadler, formerly chief engineer of Sundstrand's Hydraulic Division, will have with him as contracts manager **P. A. Anderson**, previously sales manager of aircraft equipment in the Hydraulic Division.

Sadler

Dinning

AIRLINES

Richard G. Dinning has been named assistant to **Leslie O. Barnes**, president of Allegheny Airlines. Dinning has joined Allegheny from the Air Transport Association where he was a member of the operations staff.

KLM Royal Dutch Airlines has announced that **Dr. L. H. Slotemaker**, executive vice president of foreign relations, will be its new executive vice president, and that executive vice presidents **F. von Balluseck** and **M. J. van der Ploeg** will be given the personal title of deputy president.

R. H. Burck, formerly head of Braniff Airways' southern U. S. traffic region, has been appointed the airline's general traffic and sales manager.

Cyril C. Thompson has resigned as executive secretary of the Airport Operators Council.

- **O. J. O'Connor**, American Airlines. Captain, New York. 25 years.
- **B. Payne**, American Airlines. Operations manager, Nashville. 25 years.
- **J. J. Smith**, American Airlines. Overhaul supervisor, Tulsa. 25 years.
- **E. S. Conway**, American Airlines. Aircraft maintenance foreman, Los Angeles. 25 years.
- **C. P. Hurn**, American Airlines. Maintenance supervisor, Fort Worth. 25 years.
- **R. S. Jones**, American Airlines. Captain, Fort Worth. 25 years.
- **C. R. Spears**, American Airlines. Senior vice president of sales, New York. 25 years.
- **J. G. Deater**, American Airlines. Regional personnel manager, New York. 25 years.
- **L. A. Ekberg**, American Airlines. Maintenance supervisor, Cincinnati. 25 years.
- **R. D. Wonsey**, American Airlines. Captain, Los Angeles. 25 years.

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AB 664
An OTTER of R.C.A.F. Unit Churchill—at 0107 hours Aug. 30/53
made a spectacular landing on a tiny Arctic lake at the scene
of a Lancaster Bomber crash and successfully evacuated
the complete crew of eight and their equipment—
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Perfected after years of exhaustive development under CAA/ANDB sponsorship, this new Narco DME is built to full air transport standards and has many exclusive features such as crystal-tuning.

This fine, new airline-tested DME, introduces Narco's new Sapphire line of navigation and communications equipment designed to the highest possible electronic standards unsurpassed for reliability and performance.

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AIRLINE COMMENTARY

• TRAFFIC • SALES • PUBLIC RELATIONS • *by Eric Bramley*

Are airlines so busy trying to boost traffic through items like the family plan, tours, etc., that they overlook more basic things? **E. N. Grossman,** sales manager of Arco Co., Cleveland paint manufacturer, thinks so, and he's done a job on his own salesmen that an airline should have done. Recently he sent **E. V. Rickenbacker,** Eastern Air Lines' board chairman, a memo he issued to his men.

Quit using your cars when you can fly and save time and money, he told them. He furnished sheets on which they can analyze their travel and pick the spots where airlines should be used. Saving only two days monthly by plane would amount to more than 10% of effective selling time, he said, adding: "It becomes apparent that a thorough study of your operation should be made immediately to accomplish this end."

EAL printed 100,000 copies of the correspondence for its entire mailing list, and salesmen are following up. Grossman has done quite a sales job for air travel.

•

Decision of the Pittsburgh Pirates to use Capital Airlines for all road trips during the 1954 baseball season is a significant "first." Baseball can mean substantial business for airlines, but it's been about the only sport that hasn't turned to air travel. Now that the Pirates have been sold, others will follow. Much credit goes to Jim Austin, Capital's v. p. of traffic and sales, and his staff, for their sales effort among the ball clubs. We've seen the presentation, and it's a beaut.

•

Several issues ago we revealed that airlines at Chicago planned a new system of handling interline baggage, under which Allied Aviation Service Co. would take over the entire operation. Answering queries about what's happened, here's the status: carriers agreed on a contract, but there's an impasse over how to pro-rate costs. Basic disagreement is between trunklines and local service carriers. Whether a solution can be found is anyone's guess. We'll keep you posted.

PAA Installment Plan

Pan American World Airways on May 1 introduces a nationwide credit system for air travel—10% down payment and up to 20 monthly payments. The plan, handled through Beneficial Loan System, will be available through all PAA's U. S. offices plus 1500 travel agents. PAA claims time selling of transportation has never been tried on such a basis. Charges will be somewhat higher than on a cash basis to cover financing expenses.

In major cities buyers can pick up tickets within a maximum of 48 hours after making applications; process takes about a week in smaller communities. Financing can cover air fares alone or, on pre-arranged tours, can include surface transport, hotels, sightseeing, etc. (international portions of trips must be via PAA or one of its affiliates).

WAL Promotion

Here's a new twist: Western Air Lines is promoting its Las Vegas service by distributing Union Pacific Railroad literature. About 10,000 WAL customers are receiving a colorful UP brochure on Las Vegas, Hoover Dam and Lake Mead, with a note from WAL explaining that "this folder . . . is so outstanding that we are happy to distribute it for our competitor in the hope of interesting you in a trip to Las Vegas. Those of you who don't go via Union Pacific will be very welcome aboard one of Western Air Lines' fast, frequent flights to Las Vegas." Cooperative program was worked out by **Bert Lynn,** WAL advertising and public relations director, and **Horace Northcott,** UP ad manager.

Sales and Traffic

Maxwell House is using Frontier Airlines as the "guinea pig" to test a new **single-cup package of instant coffee**—something Frontier had been requesting for a long time . . . TWA in 1953 put 508 new reservations and ticket agents through its **10-day sales and procedures basic training school.** Cost of training each employe is estimated at $275 . . .

Capital Airlines is distributing a booklet, "The Press and Capital Airlines," to all field personnel responsible for press relations. An A-1 writing job by **Bob Doty,** Capital's assistant director of public relations . . . **United Air Lines** has published a 52-page booklet, "Favorite Recipes of Mainliner Chefs." It sells for 25¢, with passengers using stubs attached to menus to order copies by mail . . . **New and enlarged pocket-size edition** of Pan American's travel guide, "New Horizons," will be published soon by Simon & Schuster. First printing will be 100,000.

Top honor as the advertiser with the best match book of 1953 was awarded to TWA by the match industry's panel of 15 judges. As shown in the photo, six TWA match books, portraying in poster style six major ports of call of the airline, are contained in a single "sleeve" container.

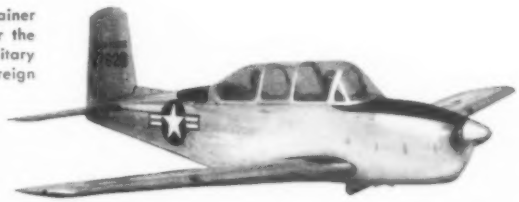
IN PRODUCTION

The acceptance by the U. S. Air Force of the *Beechcraft T-34A* as its standard primary basic trainer is a renewed expression of confidence in the ability of Beech Aircraft to build airplanes to exacting military requirements and in the integrity of Beechcraft to support its airplanes with continued engineering, service, and spare parts.

Beech Aircraft is proud of its long tradition of building military trainers. In World War II ninety per cent of all U. S. bombardiers were trained on *Beechcrafts*. Thousands of Allied and U. S. pilots and navigators have received and are still receiving their wings after instruction on Beech-built airplanes.

The *Beechcraft T-34A (Mentor)* trainer is the product of twenty-one years of accumulated knowledge and experience of Beech engineering, augmented by the latest production techniques and factory equipment. Developed by Beech Aircraft as a private venture, the airplane has been ordered into quantity production as the USAF T-34A trainer.

The Beechcraft T-34A trainer is now *in production* for the U. S. A. F. and the military services of friendly foreign governments.



Beechcraft

Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

Beech Builds: USAF T-34A • USAF L-23B • USAF C-45H • USN SNB-5 • Model 35 Bonanza • Model 50 Twin-Bonanza • Model 18 Executive Transport

Major Pacific Shifts Urged by Examiner

A major re-alignment of U. S. air services in the Pacific area is in store if the CAB adopts recommendations made recently by Examiner Thomas L. Wrenn. Among the changes proposed are:

• **Removal** of Northwest Airlines from the Seattle-Honolulu market.

• **Addition** of Transocean Air Lines, now a non-scheduled carrier, as a certificated trans-Pacific line to provide "supplemental" low-cost passenger and property service.

• **Expansion** of Pan American World Airways' U. S.-Japan operating authority to permit use of the North Pacific route, in addition to present routings via Hawaii.

• **Renewal** of Northwest's U. S.-Japan route via the North Pacific for five years.

• **Renewal** of Pan American's U. S.-Japan-China and Seattle-Honolulu routes until July 4, 1959.

• **Renewal** of United Air Lines' Los Angeles-Honolulu certificate on a permanent basis.

On the negative side, but perhaps of equal significance, was Wrenn's recommendation against a second round-the-world service as proposed by Northwest and Trans World Airlines. TWA had sought extension of its trans-Atlantic route from Shanghai to Tokyo to join Northwest's present system. Northwest had sought extension from Tokyo to Calcutta to join TWA at that point.

Wrenn said that if either of the two extensions had to be granted it should be TWA's. But he found that the proposed route (India-Japan) is "too thin" traffic-wise to support an additional U. S. carrier.

The general impression conveyed by Wrenn is that trans-Pacific services have not developed as anticipated when Northwest's and additional Pan Am services were certificated in 1948. Unsettled political conditions in Asia contributed largely to failure of estimated traffic to materialize, he said.

Wrenn said also that "persuasive arguments" can be made in favor of letting NWA's Orient certificate expire, "turning all U. S. flag service in the Pacific over to Pan American." But he does not recommend such action.

First, Wrenn said, U. S. policy calls for competitive international services, as evidenced by original certification of NWA in the Pacific area. Second, conditions may change in the Asiatic area, warranting re-certification of a carrier to compete in that area at some later date.

Since NWA has extensive facilities and investments along the route, he reasoned that it would probably be more economical for the Government to continue NWA on a five-year basis than to terminate the carrier's authority and some years later again certificate NWA or another carrier for the service.

Meanwhile the recommended change which would permit PAA to fly the North Pacific route to the Orient would involve lifting of a restriction which up to now has required such PAA flights to stop at at least one intermediate point in the Central Pacific area.

TAL Would Be First

Transocean, under the proposal, would become the first large irregular to receive a certificate authorizing both passenger and cargo services. Wrenn recommended denying the line's point-to-point route proposal, but urged a five-year certificate to permit operations on an irregular basis between co-terminals Oakland and Burbank, the Territory of Hawaii, points in the Pacific west of Hawaii, and points in the Orient.

The proposed permanency of United's Los Angeles-Honolulu route would put that segment on the same status as United's already-permanent San Francisco-Honolulu route. Pan Am would be in the California-Hawaii market with United and would be alone in the Portland/Seattle-Hawaii market for a temporary period, according to Wrenn.

Next step in the case will be briefs to the Board, which are due the end of this month. Thereafter, oral argument will be held, and CAB will then transmit its recommended decision to the White House.

CAB MISCELLANY

Helicopter Air Service has asked for seven-year renewal of Chicago area helicopter certificate which otherwise expires July 23, 1954; also requested authorization to carry passengers.

United Air Lines and Continental Air Lines propose suspension of interchange service between Pacific Northwest and Southwest via Denver from April 25 to August 22, 1954.

British Overseas Airways Corporation has been recommended by CAB Examiner Joseph L. Fitzmaurice to serve Chicago as a co-terminal with New York on its trans-Atlantic route.

CAB NEWS

AS OF NOW . . . .

Hearings in the **Large Irregular Air Carrier Investigation** moved back to Washington last month for the third session in that city. They have been twice in Miami, twice in Los Angeles, and once in Seattle. Under CAB's new expedited procedure an examiner's recommendation this summer is a distinct possibility. The issue is what place, if any, non-scheduled lines should occupy in the air transport picture.

Further proceedings in the **Colonial Merger Case** will be held in abeyance pending CAB's reaction to Eastern's statement that it has eliminated all stockholdings which led to alleged "control" violations. CAB has been asked by its Compliance Office to hold up any ruling on Eastern's statement until April 26, pending an enforcement investigation now under way.

The CAB is expected to act soon on petitions for reconsideration in the **Southern Service to the West Case** in which Eastern, TWA, and Braniff seek reversal of CAB's disapproval of their southern transcontinental interchange service.

Hearings in the **North American Airlines Enforcement Case**, subject of a long legal fight, were finally completed in Los Angeles late last month. Next step is briefs to the Examiner with a decision by summer likely.

RECENT CAB DECISIONS

• **Aerovias Interamericanas de Panama, S. A.** authorized to operate between Panama and Miami via Havana and Kingston.

• **Delta-C&S Air Lines and Western Air Lines** past period mail rate cases reopened in line with Supreme Court's "offset" decision.

• **Trans-Air Hawaii, Ltd.** ordered to file reports for third quarter, 1953, by April 12, 1954, or face suspension of license as non-certificated cargo carrier.

• **Pan American World Airways'** proposed 10¢ rate for all commodities of freight, New York to San Juan, suspended for 90 days, pending investigation.

CAB CALENDAR

Apr. 12—Hearing in Chicago-Detroit Local Service Case. Washington, D. C. Docket 6411 et al.

Apr. 13—Hearing in Aero Finance Corporation Enforcement Proceeding. Washington, D. C. Docket 5779.

May 3—Hearing in Pioneer-Continental Merger Case and Braniff-Continental Merger Investigation. Washington, D. C. Docket 6457 et al.

May 4—Hearing in Tuya Cuban Express Corp. Foreign Freight Forwarder Case. Washington, D. C. Docket 6523.

May 4—Hearing in Denver Service Case (TWA, et al.). Denver, Colorado. Docket 1841 et al.

May 17—Hearing in Hawaiian carriers Mail Rate Case. Tentative. Docket 6305.

May 18—Hearing resumed in Denver Service Case. Washington, D. C. session. Docket 1841 et al.

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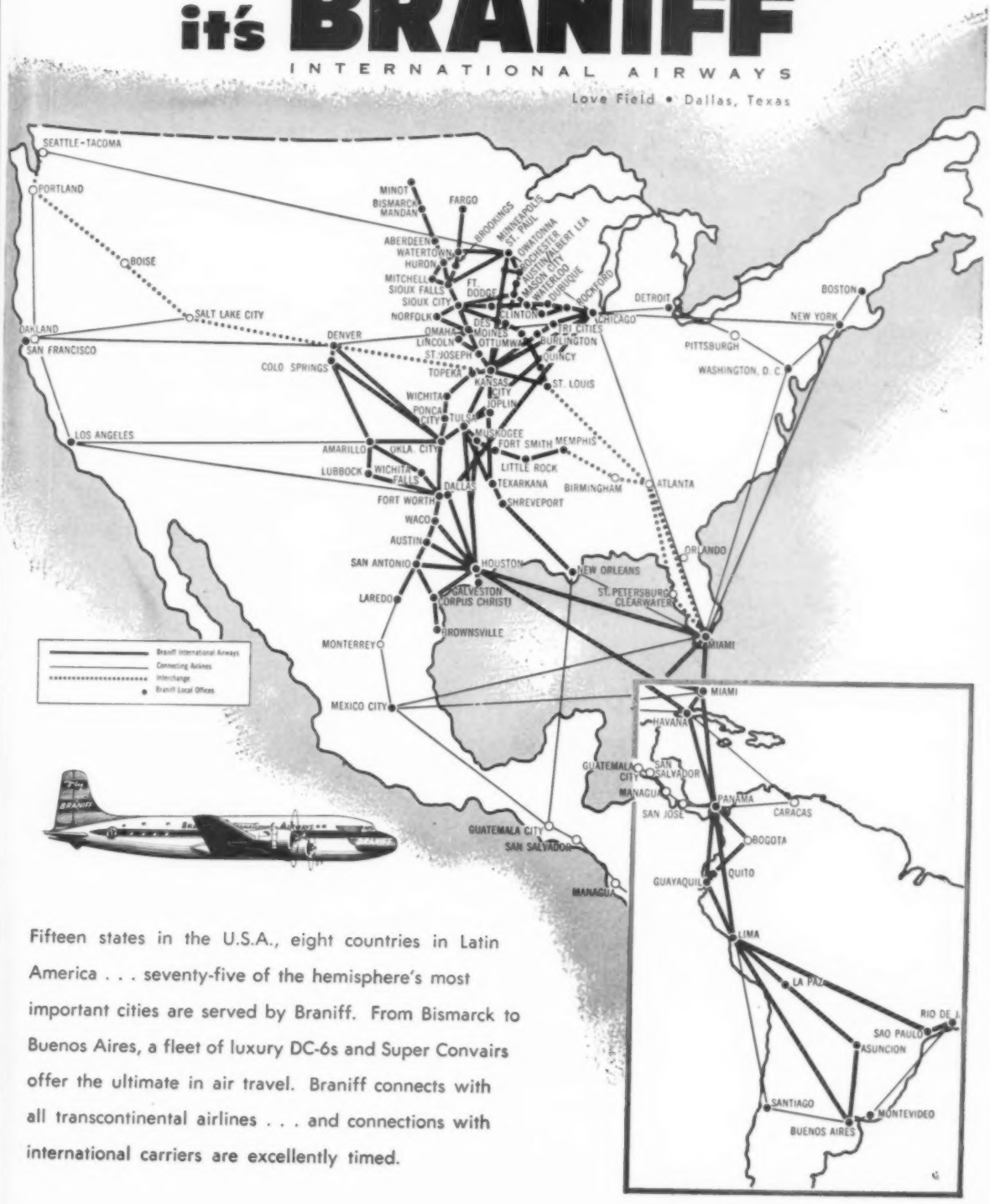

Fifteen states in the U.S.A., eight countries in Latin America . . . seventy-five of the hemisphere's most important cities are served by Braniff. From Bismarck to Buenos Aires, a fleet of luxury DC-6s and Super Convairs offer the ultimate in air travel. Braniff connects with all transcontinental airlines . . . and connections with international carriers are excellently timed.

INTERNATIONAL AVIATION

Edited by Anthony Vandyk

INTERCOM

Aptness of Fairchild slogan "Freight Takes a Boxcar . . . Not a Pullman!" has been demonstrated by the big upswing in Trans-Canada Air Lines' cargo business in the few months that the carrier has been operating an aircraft designed as a freighter. Paradoxically this is not a Fairchild model (neither the C-82 nor the C-118 is yet available commercially) but Britain's Bristol 170, one of the ugliest but most practical transports ever designed (someone once suggested that it should be called the "Freightful").

It is a sad fact that the Bristol 170 is just about the only commercial freighter currently in production anywhere in the world. Nothing like it is available for long-haul work. Although their manufacturers may describe them as freighters, the Douglas DC-6A and Lockheed L-1049B are really more like seatless automobiles than trucks of the air. Most of the relatively few (compared with the DC-6B) DC-6A's sold so far have been converted into passenger transports (even extremely freight-conscious KLM will switch its DC-6A's to passenger work for this summer's season). The almost complete lack of L-1049B sales testifies to commercial operators' reaction to the all-cargo version of the Super Constellation. In all fairness, it must be added that the military versions of both the DC-6A and the L-1049B have sold well.

Equipment problems are of course not the only reason why cargo is the Cinderella of international air transport. Although part of the above-mentioned upswing in TCA's freight business resulted from a rate cut, too many of the IATA airlines seem uninterested in actively developing the air freight market and have steadfastly refused to reduce cargo rates in the way that they cut passenger fares in introducing tourist-class travel. It is a sad reflection of their attitude that the IATA secretariat has no cargo expert.

But all is not gloomy on the international air cargo scene. More operators are starting all-cargo flights across the Atlantic (Swissair is the latest) and the equipment situation is looking brighter. Commercial availability of some of the more interesting military boxcars of the air may not be too far distant.

Qantas Takes Over BCPA Pacific Route

A new carrier appeared on the trans-Pacific scene at the beginning of the month when Australia's Qantas Empire Airways took over the Sydney-San Francisco-Vancouver route of British Commonwealth Pacific Airlines, as part of a big shuffle affecting BOAC and Tasman Empire Airways. Basically it involves the liquidation of BCPA and the transfer of that operator's fleet of three DC-6's to TEA, which is now owned equally by the Australian and New Zealand governments.

The TEA DC-6's, in addition to linking New Zealand with Australia, will also operate from New Zealand to Fiji, connecting with the Qantas trans-Pacific service. Qantas will use Super Constellations on this run starting in May (the first of the eight was delivered late last month). In the meantime the old BCPA DC-6's will operate the route; when released they will replace TEA's Short Solent flying boats.

As a result of the liquidation of BCPA, Qantas will take over the former's order for three Comet II's, but probably will use them on the London-Sydney run rather than on the trans-Pacific run, as projected by BCPA.

BOAC's round-the-world service plans apparently have been affected, at least temporarily, by the changes. Indication that BOAC will extend its trans-Atlantic route to San Francisco without continuing across the Pacific to Australia, as originally planned, is contained in a British government statement: "Qantas will operate to the United States and Canada, connecting with BOAC at San Francisco when BOAC extends its North Atlantic services to that point."

Lufthansa Plans Get Major Changes

Plans for the new Lufthansa have been revised considerably as result of an agreement between Luftag, the German airline's precursor company, and the two British airline corporations.

Latest reports from Europe indicate that British European Airways may take delivery of the four Convair 340's ordered by Luftag in view of the continuing ban on Germans owning or operating aircraft. BEA and BOAC may receive interim contracts to operate routes on behalf of the German airline. It is also reported that Luftag officials are taking an increasing interest in the Vickers Viscount.

Japan's first convertiplane, the Kayaba Heliplane (above), is actually a converted Cessna 170B fuselage with a 180-hp Continental engine in the nose. The rotor is powered by three Ishikawajima ramjets.

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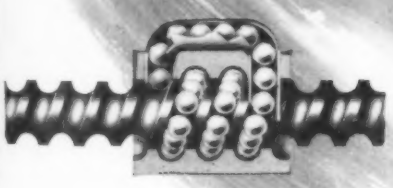


Saginaw Screws are also being used to improve performance in many products outside the field of aviation. To name a few: Feed mechanisms on double head grinders and heavy duty railroad car wheel lathes; control mechanisms on D.C. arc welders; actuators in the 4-way automobile seat adjusters; manual and power steering.

65

Saginaw STEERING GEAR DIVISION

GENERAL MOTORS CORPORATION, SAGINAW, MICHIGAN • MANUFACTURERS OF SAGINAW POWER STEERING

INTERNATIONAL AVIATION

MANUFACTURING

NETHERLANDS: Fokker Aircraft Co. now lists the basic price of the F.27 twin-turboprop transport at $394,800 (equipped airframe, $316,400; two Dart RDa5 engines, $64,400; and two propellers, $14,000). Direct operating costs are quoted as 13.3¢ and 15.65¢ per ton-mile—at 34,200 lbs. and 32,630 lbs. take-off weight, respectively—for a 300-mile stage.

GERMANY: License production of Fokker trainers by Heinkel is under discussion. Deal largely hinges on whether NATO planners will agree to the German Air Force being trained on the S.11/S.12 and the S.14, none of which has yet been adopted by NATO.

License production of the SNCASO Djinn helicopter has been discussed with several manufacturers including Heinkel, Henschel and Siebel-ATG. Another French company, Turbomeca, may license its gas turbines to Daimler-Benz.

First SNCASE Caravelle fuselage has come off its jig and work has been started on the second; the first was within 2.2 lbs. of its estimated bare weight. The jet transport is expected to fly early next year.

BRITAIN: Production models of the Vickers Valiant jet bomber are now flying and about 10 should be available to form the first RAF squadron of these aircraft in the fall.

The Nene-powered experimental Viking has now been reconverted to normal configuration with piston engines and has been sold to Eagle Aircraft Services, Ltd.

AIRLINES

TURKEY: Devlet Hava Yollari has ordered seven DH Heron 2 transports: six will be 15-seaters and one an eight-seat executive aircraft. Deliveries to the Turkish state-owned airline will start almost immediately.

NETHERLANDS: KLM does not plan to buy the DC-7 or the Comet II and will probably defer large-scale purchases of new equipment until about 1958, a company official stated late last month. Helicopter services will probably be inaugurated by KLM in 1957 or 1958.

PORTUGAL: Transportes Aereos Portugueses has ordered three Lockheed Super Constellations for use on routes to southern Africa and South America.

SPAIN: Merger of Aviacion y Comercio with Iberia is indicated. Spanish government, which owns Iberia, is buying into Aviaco (25 or 30% interest) with an option to increase its holding to 51% of the company's stock. Aviaco is buying some DH Herons to supplement its Bristol 170's and SNCASE Languedocs.

EGYPT: Misrair has ordered three Vickers Viscounts for delivery in the summer of 1955. Viscount sales now total 91 aircraft.

BRITAIN: BOAC was due to resume a second Comet service—London-Colombo—on April 7. The jetliners were returned to operation on the London-Johannesburg route on March 23, and will soon be re-introduced on the Singapore and Tokyo runs.

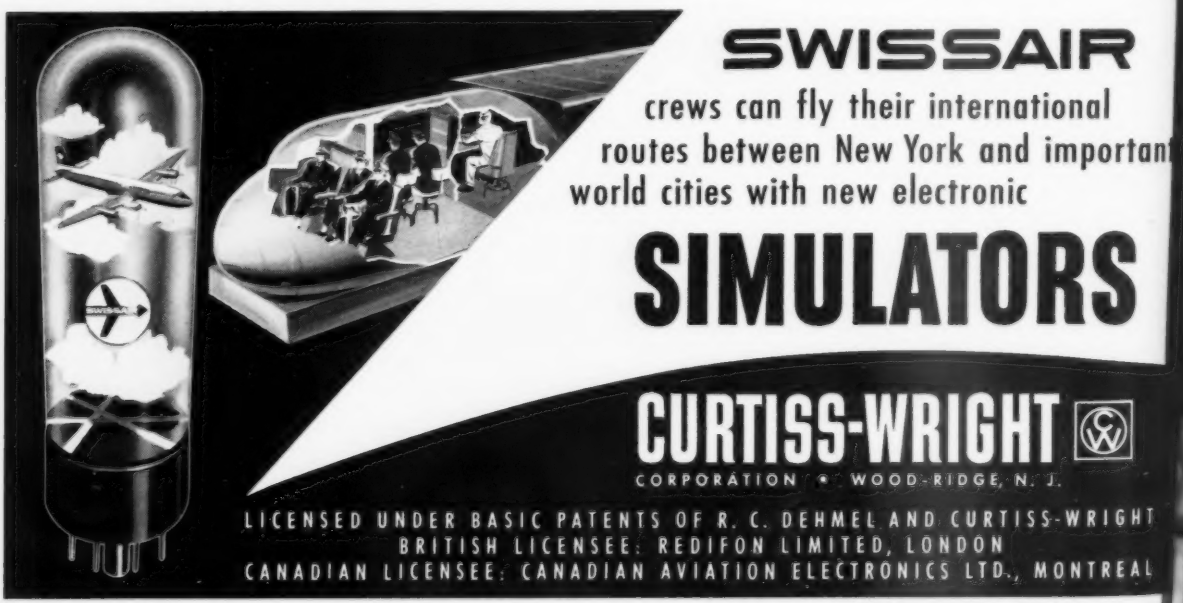
MILITARY

BURMA: First of two Bristol 170 Freighters for the Burmese Air Force has been delivered.

BRITAIN: Royal Navy's super-priority Fairey Gannet anti-sub aircraft is expected to enter squadron service shortly. It will replace the Royal Navy's Avengers.

British mirror device for deck landings can be used on airfields if required. A series of lights mounted at the stern of the ship focus into a mirror and appear to the pilot as a single blob of light which must be kept in line with a row of colored lights on either side of it.

SOUTH AFRICA: South African Air Force now has 15 squadrons—six regular and nine "active citizen force." Equipment includes Spitfire 9's, Vampire 5's, PV1 Venturas, DC-3's, and Doves.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With its radar tracking and fire control system, the Mark 4 can roam farther and exceeds the range of any other interceptor in the world. A CF-100 recently flew a 2100 mile R.C.A.F. non-stop mission in 3 hours and 50 minutes.
The role of this long-range, all-weather interceptor, powered by two ORENDA jets, also designed and built by AVRO Canada, is the defense of North America against attack through the Arctic. However, because of its inherent versatility, the CF-100 could be readily adapted to a variety of tactical operations.
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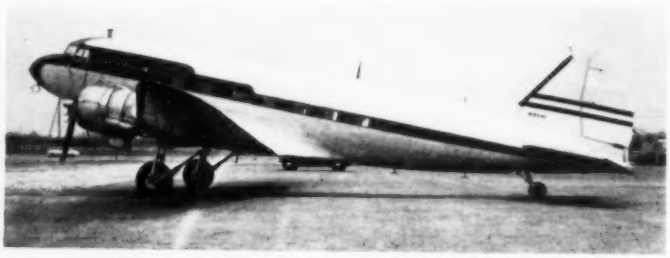

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WAYNE W. PARRISH

Sideshow. Looking backwards, it all seems rather silly. When our Air France press party went to this Sahara oasis of Bou Saada I thought it would be a good gag—for this page, at least—to prove the oft-heard rumor (which I never disbelieved anyway) that Arab women remove their pubic hair to suit the whims of the Arab male population.

I've always been intrigued by the customs of other peoples in faraway lands, so this seemed to be a challenging and suitable bit of research. As it turned out, in retrospect, I guess it would have been quite suitable merely to accept the rumor as a fact without going to the trouble of proving it on a random sampling basis.

Here I was with my somewhat battered up Arab guide on the street (unpaved) named for the Ouled Nail dancing girls in the crowded Arab section of Bou Saada. It was mid-afternoon. My friend knew just where to go to negotiate a private dancing show for his new-found client, at my agreed price of 400 French francs ($1.25). After a lot of jabbering and waving of hands between my guide and the madame of the two-story whitewashed house, I was taken into a room of about fourteen by fourteen.

There were no windows but the room was well lighted by several large uncovered electric bulbs. Persian rugs, or facsimiles thereof, were on the floor and on three of the four walls. Around two sides were long benches, also covered with rugs. There was virtually no other furniture or furnishings. It was obvious that this was a room used only for private shows.

The Dance Begins. My Arab friend excused himself. Seems that Arab men can't watch Arab women dancing in the nude but they seem to have no qualms about letting the babes dance for anybody else. The door closed behind him and I wondered what sort of a situation I had now gotten myself into. But I've always taken things as they come. So, with my hat and topcoat still on, I sat down on the rug-covered bench.

Things began happening fast. First a gal arrived to provide the music, which consisted of a very good rhythm beat out on a drum which had one face uncovered. I'll give her credit. She really worked on that drum and the results were good.

Next two gals came out from behind a curtain and began dancing before me. Not a stitch of clothes on either. But what gave me a start was that neither girl could have been much over 12 years of age, 13 or 14 at most, although I can't claim to be a judge of unclothed teenagers. What crossed my mind at once was that in the U. S. I'd be hauled up before a magistrate for contributing to the delinquency of minors. Pure jail bait. But this was Algeria in North Africa, where life begins at 11, not Kansas.

Arab Teenagers. As for the dancing, well, what can one get for $1.25? It was supposed to be good, I guess. As for my scientific research, the point was also proved to my complete and somewhat unenthusiastic satisfaction. For centuries the Arab women have been accustomed to remove all the hair below the neck by a depilatory made of citrus juice, olive oil and other stuff. No shaving, so I'm told.

Even teenagers in the Arab world seem to lack real beauty. Their bodies are somewhat ungainly. Pot bellies develop early. Neither of these gals could have rated the chorus in a New York night club. Just how long that dancing went on I don't know. I was ready to leave after the first half minute but the trio was working very hard to please, so I just waited it out. In due time the show was over.

The girls disappeared behind the curtain to dress, my Arab friend returned, and then came time to pay off. Cigarets were distributed and then the 400 francs and then came the usual request for tips. I ended the afternoon with a total expenditure of $2.00 and chalked it all up to experience (I wish all my experiences were that inexpensive!).

More Dances. I got back to my hotel at the end of the afternoon and before long the other members of our party who had been hobnobbing with those flea-bitten camels and doing some shopping began to return. There was plenty of talk about the troupe of Ouled Nail dancing girls which was coming to the hotel and would perform while we had dinner. I was anxious to know how they would measure up to my own show.

The dinner was absolutely delicious. First came a fine rich soup. Then we dug into two lambs which had been roasted over a fire outside the hotel. Rarely have I tasted such wonderful meat. No knives or forks—just tear the meat off the carcass by hand, Arab style. We sat on hassocks around the fireplace in the hotel lounge.

Then came the gals, not the ones I had seen but definitely teenagers, and a little prettier. They were lavishly dressed in fancy costumes punctuated by wide belts and necklaces of gold coins. They were accompanied by drum and flute in their performances and I must say they did pretty well. The special Ouled Nail technique seems to be the ability to bounce a tassel hanging in front from the belt by flexing the muscles of the lower stomach. Whether it's better than a first class burlesque show depends on how far away you are from a burlesque show. It was hot stuff in Bou Saada, anyway.

Sans Clothes. Then came the rumors that we would see the same girls dance in the nude after the hotel affair was over. So in due time we piled into waiting cars and drove to the center of town and went inside a third-class hotel to the bar. The entire French population of Bou Saada had been alerted, it seems, because I counted roughly 75 people crowded around the walls of this bar room. Our party comprised about thirty.

So after everybody had assembled, the lights were dimmed. The Arab musicians turned toward the wall and one by one these gals came out to perform sans clothing. But each had a thin veil and the lights were so low that it all seemed a little silly, but everybody seemed to be well thrilled at this Arab peep show, including the female members of our party (**Jinx Falkenberg**, et al.), and I decided that it was a good thing I had conducted my own research into female Arab customs, because with those dim lights my research would have been subject to considerable doubts.

That's Enough. Back at the hotel I found my Arab friend waiting for me. He had been on duty for hours hoping to line up a real dance for me and my friends. But the hour was too late. I had seen all the Arab teenagers I cared to see in a lifetime.

So that is the finish of the story of the life and excitement in the Sahara oasis of Bou Saada in Algeria. Anytime you want to see the lowdown, call on me. I can find a good Arab guide at the drop of my hat and if I can't, an Arab is certain to find me.

Since visiting Bou Saada I've thought of those gals and how quickly their lives move from childhood to puberty to child-bearing to old age in 20 to 25 years and how little they really have to live for. By the time an American girl is going through college, the Arab girl of the same age is old, her life spent in subservience with so few rewards.

But in Bou Saada they did their best to please and if my adventure did nothing else it added another page to that great dramatic story of this world which is the vast diversity of customs and races on this single globe of ours.

FACTS ABOUT

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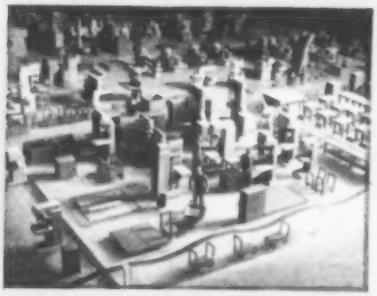

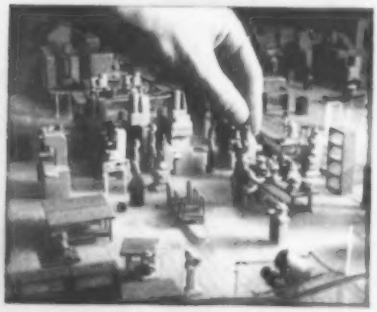

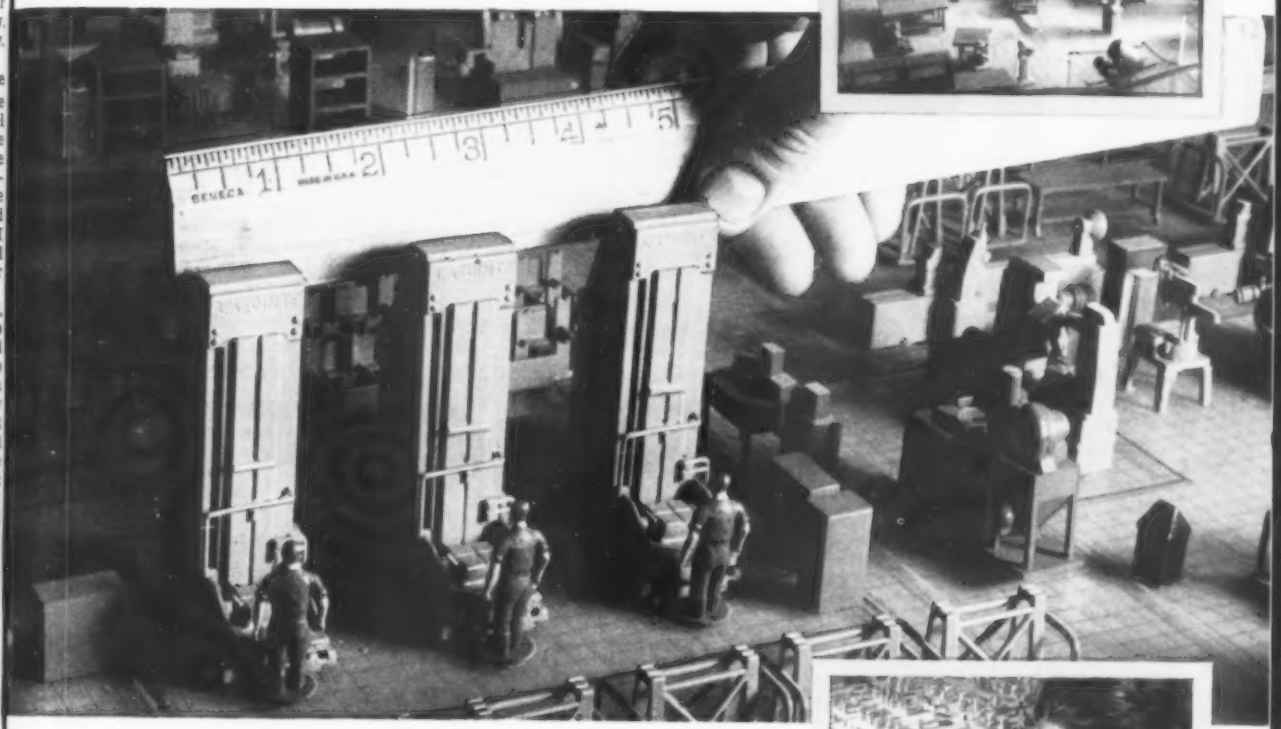

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News at Deadline

General Vandenberg Dies at 55

Gen. Hoyt S. Vandenberg, second chief of staff of the U. S. Air Force, died April 2 at Walter Reed Hospital, Washington, D. C., following a lengthy illness. He was 55.

Gen. Vandenberg was admitted to the hospital last October 3. Cancer was cited as the cause of his death.

Leading spokesman against last year's $5 billion reduction in AF funds, Gen. Vandenberg became chief of staff on April 30, 1948, succeeding Gen. Carl Spaatz. He was renominated by former President Truman for a second term as chief of staff on March 6, 1952.

Suffering ill health during his second term, Gen. Vandenberg retired from active duty on June 30, 1953.

A native of Milwaukee, Wis., Gen. Vandenberg was graduated from the U. S. Military Academy on June 12, 1923, at which time he was commissioned a second lieutenant.

Gen. Vandenberg led the AF in its formative stages as a separate military service. He has been credited with bringing about air power emphasis on long range bombing as a deterrent force.

He was succeeded in the top AF post by Gen. Nathan F. Twining, present AF chief of staff.

Services were held April 5 at Washington Cathedral and were attended by President Eisenhower. Burial was at Arlington National Cemetery. He is survived by his wife, the former Miss Gladys Rose; a daughter, Mrs. Robert R. Miller of Colorado Springs; and a son, Hoyt, Jr., an AF lieutenant stationed in Germany.

USAF Changes Order From 240's to 340's

The first Air Force order for the Convair 340 has been placed, with 36 of the twin-engine aircraft scheduled for delivery. The USAF will accept the planes instead of 240's, which had been ordered earlier. The designation for both types of aircraft will be C-131B.

The change will enable Convair to dispose of some 340's which had been produced in excess of commercial demand. The planes will be used as "flying laboratories" to test electronic and other airborne equipment.

The Navy has also ordered its first 340, designated the R4Y-1 and slated for use as an executive aircraft.

Temco Executives to Sell 300,000 Shares

Three executives of the Temco Aircraft Corp. plan to sell 300,000 shares of the firm's $1 par common stock if permission is granted by the Securities and Exchange Commission. The stock, currently selling for over $7 a share, would be put up for public sale by Van Alstyne, Noel & Co.

According to the prospectus filed with the SEC, the executives are:

- **Robert McCulloch,** president, selling 95,000 shares and retaining 17,159;
- **H. L. Howard,** executive vice president, selling 100,000 and retaining 35,739;
- **D. Harold Byrd,** director, selling 105,000 and retaining 155,967.

Board Revokes AA Mexican Exemption

A controversial exemption which was designed to permit American Airlines to fly non-stop from New York to Mexico City has been revoked by the CAB. The exemption, issued by a 3-2 vote on January 21, had never been used by American because of a U. S. Court of Appeals stay order and lack of authority from Mexico.

The Board stated that it was acting on information from AA to the effect that Mexico would grant authorization only if certain measures were taken in regard to rights for a Mexican airline, which American was not authorized to negotiate. Members Lee and Adams issued a statement saying "It is our view that the exemption should never have been granted in the first place."

Convair, G-D Execute Merger Agreement

The agreement which will merge Convair and General Dynamics has been executed by the directors of both firms. Under its terms, the president and board chairman of the merged firm would be John Jay Hopkins, who now holds the same positions in General Dynamics. Convair president Joseph T. McNarney would become a senior vice president of G-D. Directors of both would serve for one year on the merged board.

Convair would retain its identity, becoming a G-D division.

Martin Triples Profit, Cuts Debt in Half

During 1953 the Glenn L. Martin Co. increased its sales about 30%, increased its net profit approximately 300%, and reduced its debt by more than half, according to the firm's president, George M. Bunker.

Net income in 1953 reached $15.1 million, up from the 1952 figure of $5.8 million. Sales rose from $144 million to $208 million.

Martin's debt at the beginning of 1953 totalled $26.9 million. By the year's end this had been reduced to $11.6 million. When Bunker assumed the presidency of the firm, Martin had just suffered a 1951 net loss of $22.5 million on its 4-0-4 transports.

Backlog at the end of 1953 was $550 million, with present orders indicating production "well into 1956."

Eastern, TWA Profits Slumped in 1953

For the 19th consecutive year, Eastern Air Lines showed a profit in 1953, although the excess profits tax reduced it below the total for the previous year. Net earnings for EAL have been reported as $7.9 million, as compared with 1952's total of $8.5 million. In 1952 there was no excess profits tax; in 1953 it absorbed $1.25 million.

Operating revenues rose 22% to $144.5 million, but expenses rose 24% to $127.1 million. Revenue passenger-miles rose 25% to 2.6 billion; passenger revenues rose only 21% to $136.5 million, reflecting expanded coach services.

- **Trans World Airlines,** despite record gross revenues, also suffered a drop in net income: from $7.7 million to $5.1 million. Increase in depreciation charges on new aircraft was cited as the primary reason. Losses on the international division, currently operating on a temporary mail rate, were also mentioned as a reason for the drop in profit. Traffic increased 22% to 3.1 million passengers, carried almost 2.9 billion passenger-miles.
- **Northwest Airlines'** profit picture was brighter: net income after taxes reached $1.9 million in 1953, compared with $1.8 million in 1952. Of these totals, operations produced $1.3 million profit in 1953, compared with only $555,000 the previous year. The statement replaces an earlier report which listed slightly lower income totals.

USAF Carry-over Funds Doubled

The USAF now expects to carry-over almost twice as much on obligated new money for aircraft and related procurements into fiscal 1955 as it anticipated in the January budget message. At that time, about $1.9 billion was to remain unobligated when the new fiscal year began, but obligations have been lagging, "only $164 million in new orders through the end of February, out of $6.2 billion available." Current estimate placed the unobligated money which will be available July 1 at $3.7 billion.

Similarly, the Navy had $1.86 billion available when fiscal 1954 began and planned to obligate all of it. By February 28, however, only $372 million had been ordered and $1.2 billion is expected to be obligated before June 30. This will leave the Bureau of Aeronautics with $260 million in unobligated plane funds to carry-over.

Germany May Get NATO Sabrejets

The German Air Force may receive several hundred Sabrejet fighters from the RAF and the RCAF under the NATO program as later model aircraft become available to those services. The Sabres in the RAF would be replaced by Hawker Hunters, and those in the RCAF would be replaced by later versions powered by Orenda engines instead of J47's.

Mohawk Orders S-55

A Sikorsky S-55 helicopter has been ordered by Mohawk Airlines, which plans to begin using it this summer over part of its routes. Mohawk is the first local service airline to order a helicopter. Delivery is scheduled for April 26.

Braniff Moves to Drop Coach Services

Braniff Airways has decided to get out of the air coach business, and effective April 25, CAB willing, will cancel all of its coach fares and schedules.

BNF, operating off-peak-hour coach flights between Chicago and Dallas via various intermediate points since December of 1953, calculates that for the first three months of operation, the coach services cost the company $11,600 (December), $12,300 (January), and $14,400 (February), through diversion of traffic from first class services. Furthermore, in its statement to CAB, the carrier says that since there is no indication of an increase in passenger loads it believes that making the flights first class would increase revenues.

Viscounts Ordered by Trans-Caribbean

The emphasis on U.S. certification of British transports has shifted from the de Havilland Comet III to the Vickers Viscount Turboprop.

Trans-Caribbean Airways president, O. Roy Chalk, has confirmed receipt of a draft contract from Vickers-Armstrongs, Ltd. for delivery in the fall of 1955 of two Viscounts at "roughly $750,000 each," and has asked the CAA to act on certification before final signing.

The CAA is already at work on a preliminary study of the Viscount. The plan is to handle the approval within the terms of the 1934 U.S.-U.K. reciprocal agreement on certification, and to rely heavily on British experience gained in operation to date. The current study is to determine what special conditions may be necessary to supplement British civil air regulations. Following this study the CAA expects to meet with British Air Registration Board officials, probably in Britain for more detailed discussions.

Final certification of the Viscount will require (1) ARB assurance that it complies with certain technical standards mutually agreeable to CAA and ARB; (2) submission of design data to CAA covering other aspects of the airplane; and (3) examination of a Viscount by CAA technicians during actual operations and under special conditions.

Douglas Calls Timing Big Jet Factor

Ten years from now turboprop engines may have proved themselves more desirable than jets, even though less than 2000 hours have been logged at present on high horsepower turboprop flight. In the meantime, any manufacturer who enters the turbine transport market is launching himself upon a $64 million gamble.

The forecast and the estimate are Donald W. Douglas, Jr.'s, as presented to the St. Louis Mo. Advertising Club. Douglas set the price for work through the prototype stage of a jet transport at about $35 million, with costs up to the delivery of the first production aircraft raising the total into "that magic $64 million dollar neighborhood . . . a neighborhood into which a conservative company is foolhardy to wander without adequate protection."

Best protection is a keen sense of timing, in Douglas' opinion, and the time is not now. He assured his listeners, however, that "when the airline operators inform us that a well-designed, economical jet transport is a requirement of the air-traveling public, we shall be ready."

Whether the British were not ready too soon is debateable. Starting to revive their transport aircraft industry that had languished during the war years and relying upon their jet engine knowledge and experience to win world markets, the British had to move fast. "To take full advantage of their position, it was essential that they hasten their prototypes and reveal their first production models as soon after the war as possible. Necessity afforded them little choice in regulating the time element."

"The delays which circumstances forced on the American manufacturers," he added, "may prove something less than a competitive catastrophe."

Douglas did not hazard a guess as to just when the jet transport might start making up for lost time on the American manufacturing scene, but he noted that the changeover might be faster than has been expected. "I strongly suspect that the deliberate, well ordered progress which has been the rule in air travel over the past generation may now enjoy a period of acceleration."

The aircraft that will result from such acceleration may well be designed to have a 50% break-even load factor (compared to the Comet's 75%), some means of effectively slowing down after landing, and some means of reducing the noise of its engines.

Within 20 years Douglas foresees turboprop freighters carrying cargo at less than present trucking costs, supersonic passenger aircraft, atomic-fueled military aircraft of virtually unlimited range, and gasoline and rocket-fueled military planes with twice the performance of those now flying.

Norwich University Names Advisors

Norwich University of Vermont has established an advisory board to assist with curriculum development and programming in its Department of Aviation. The university offers a four-year course in aviation administration, leading to a B.S. degree.

The advisory group will include: Dr. Leslie A. Bryan, director, University of Illinois' Institute of Aviation; Ken Ellington, asst. to the president, Republic Aviation Corp.; Joseph T. Geuting, mgr. of AIA's Utility Aircraft Council; Gordon Gilmore, v.p., Trans World Airlines; Charles S. (Casey) Jones, president, Academy of Aeronautics; Otis E. Kline, exec. v.p., United Air Lines; Lauren D. Lyman, v.p., United Aircraft Corp.; and Wayne W. Parrish, editor and publisher, AMERICAN AVIATION Publications.

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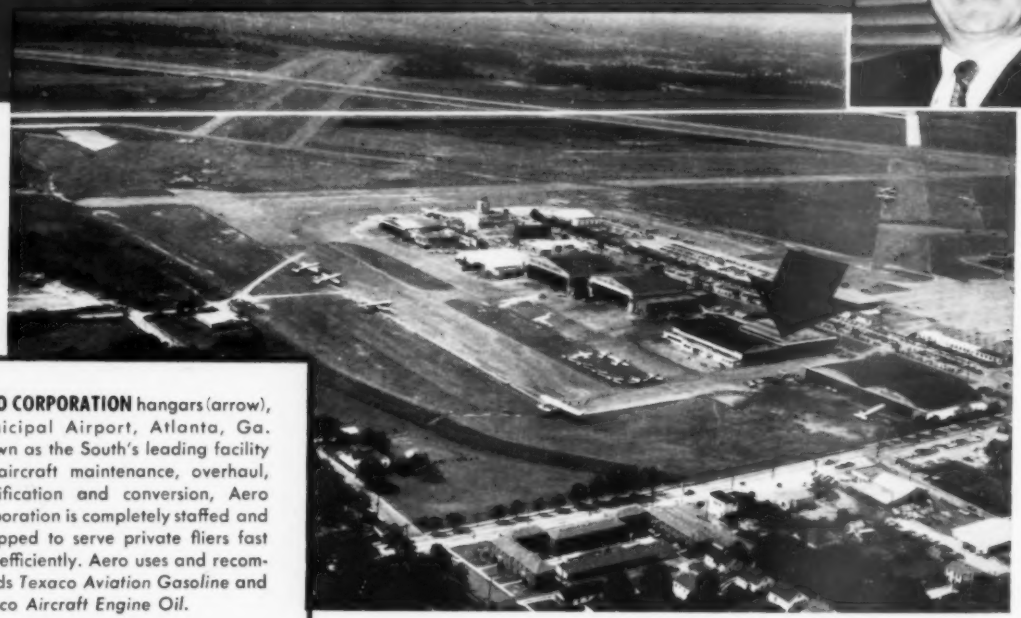

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